NATURE MAGAZINE

FEBRUARY 1932 35¢ VOL. 19, NO. 2

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by R. BRUCE HORSFALL

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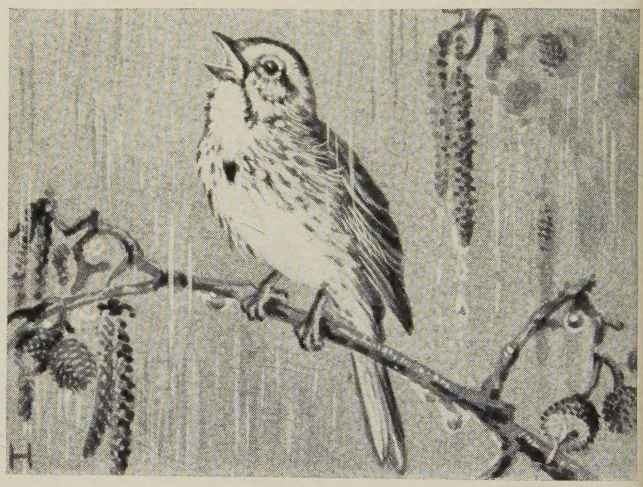

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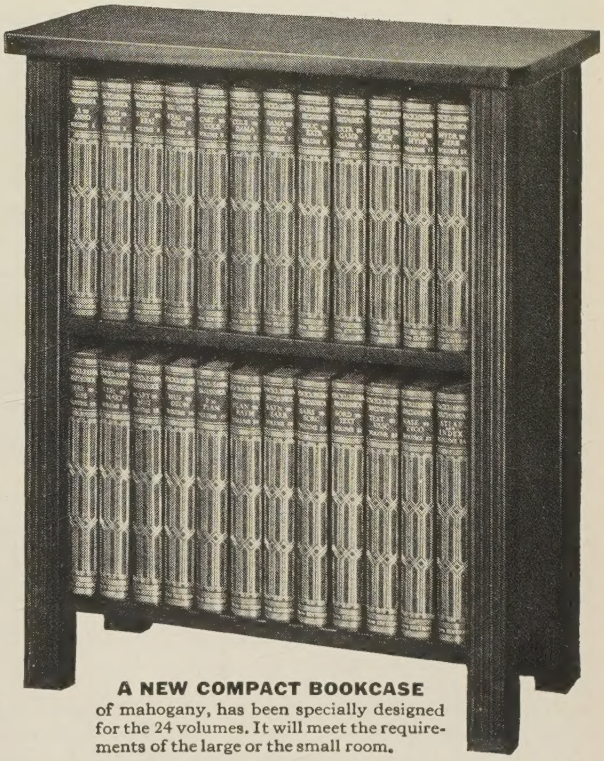

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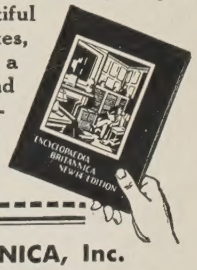

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A FORTUNE IN SILVER

Buried Treasure

Perhaps not a very large percentage of the thousands of camera enthusiasts knows that there is buried treasure in every roll of film. It is silver, for silver is the active element in that mysterious light sensitive material called the "emulsion" with which the film is coated. It is silver that really performs the magic of recording on the film, the latent image which is finally brought out in the negative by development.

In the picture above you get a glimpse into a large safe in one film manufacturer's plant. The bricks or bars you see are silver bullion, each one weighing about 42 pounds. Needless to say, the safe contains a fortune in silver.

Next to the government mints, this company is the country's largest consumer of pure silver bullion, using annually the equivalent of one-tenth of the silver mined in the United States.

To prepare the silver bullion for use in emulsions the bars are dissolved in nitric acid and pure crystals of silver nitrate are obtained. Other ingredients of the emulsion are potassium iodide, potassium bromide and gelatin.

Photographic gelatin is usually prepared from calf skins by soaking the skins in lime water and subsequently extracting the gelatin with hot water. The gelatin is dissolved in water, and bromide and iodide solutions carefully mixed with it. To this mixture, heated to the correct temperature, is added a silver nitrate solution. The precipitate of the sensitive salt is held in suspension by the gelatin, and receives the term "emulsion".

As previously mentioned, it is this buried silver treasure in your film that actually records the image.

The use of pure silver bullion is but one detail in the making of film.

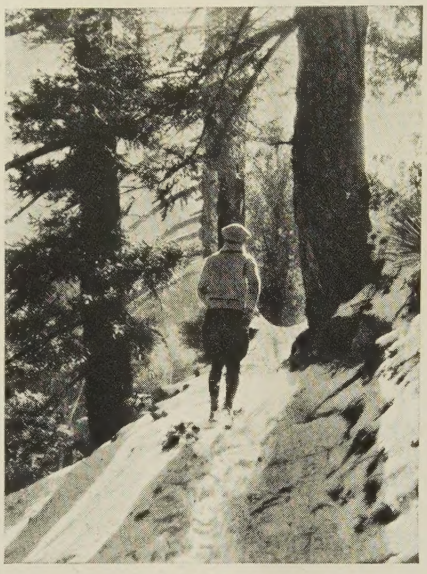
Clean Lenses—Brilliant Pictures

Those who wear glasses clean them when the surface of the lens becomes smudged or smoky. Clean eye-glass lenses give clear vision to the wearer and similarly, the camera cannot see so well if its eye (the lens) is murky. The brilliancy of your pictures is dependent upon the cleanness of the lens. Note the pictures throughout this magazine. They are crisp and clear but had they been made with smudgy lenses they would have appeared foggy and indistinct. The camera eye cannot see through dirt. The lack of brilliance will, of course, be governed by just how dirty a lens is.

To clean the lens there is nothing better than a soft, unstarched linen handkerchief. The rear surface can easily be reached by

Photographic DEPARTMENT

EDITED BY ROBERT T. LOWELL



AGAINST THE LIGHT

For Snow Scenes

If you would obtain the best possible rendering of the tones in a sunlit snow scene, use a filter. The filter, however, will not make a marked improvement in the result unless the sun is shining and the bit of landscape is such that shows both sunlight and shadows. Snow photographs white, with or without a filter, but the advantage derived from the use of the proper filter is that contrast will be considerably increased and a more brilliant picture obtained.

Because of the great reflection from snow, the shadows in a snow scene seldom appear very deep, but are gray in weak sunlight and of a bluish tone in strong sunlight. The orthochromatic filters, such as the Wratten K series of filters, will slightly increase the contrast between the shadow and sunlight parts, but a Wratten G filter will considerably increase the contrast. The G is not an orthochromatic filter, but is known as a contrast filter, and being of a deep yellow, requires a longer exposure to be given than is necessary with any of the other filters to which we have referred.

Striking pictures may be made "against the light" so that the shadows fall toward the camera. Care should be taken, however, that the lens is shielded from the direct rays of the sun. This was done very successfully in the picture above as the author stood so that the sun was directly behind the large tree at the right.

Clean Lenses—Continued

removing the back of the camera. If the camera has a double lens (one behind and one in front of the shutter diaphragm), the front combination can be removed by turning to the left, which will allow you to work through the shutter opening, when

A GOOD UNDERSTANDING!

WHAT THE CAMERA SAW

Constructive Criticism

A "Good Understanding", But—

They say the camera never lies, but this looks like material evidence to the contrary. Wait, though, before we pronounce sentence, for maybe it *is* just what the *camera lens* saw.

Evidently the author of this amusing picture held the camera quite low, and probably less than a yard from the soldier's feet which were stretched out full length in front of him. His head and shoulders are at the right distance from the camera to give good perspective.

Perspective, that's it! In order to get good perspective it is necessary to be a reasonable distance from the object being photographed. Here the subject's head and shoulders were at a proper distance for good drawing (or perspective), but his feet were at least 36 inches nearer to the camera.

The answer is that the perspective in a picture is determined by the point of view from which the lens makes the picture. The decision, then, is "Not guilty". The camera did not tell a falsehood, but portrayed exactly what it saw—and just about what the eye would see if one looked at the subject from the same point of view.

True, this is a much exaggerated example of bad perspective, but in making portraits, or, in fact, "close-ups" of any object, we should be careful to see that no part is very much nearer the camera than the rest of the subject.

In making portraits we are sometimes likely to permit our subject to place a hand well forward on the arm of the chair. If working within three or four feet with our camera, the hand will appear abnormally large. Better have the hands in the lap in a natural position and close to the body, with most of the fingers folded under.

Similarly the legs should not be extended. Do not let the person you are picturing slouch back into a comfortable chair.

Clean Lenses—Continued

set for "time", with the handkerchief over the end of a match or lead pencil. Be sure, when replacing the front lens, to screw it into the shutter as far as it will go.

The suggestion to work through the shutter opening also applies to cleaning the front surface of the single lenses fitted to the box cameras and certain models of folding cameras.

While it is wise to inspect your camera lens by looking through it occasionally, let us give a word of caution against forming the habit of wiping it briskly with a cloth very often.

Now it's easy to Keep and show your snapshots!

No Paste
No white ink
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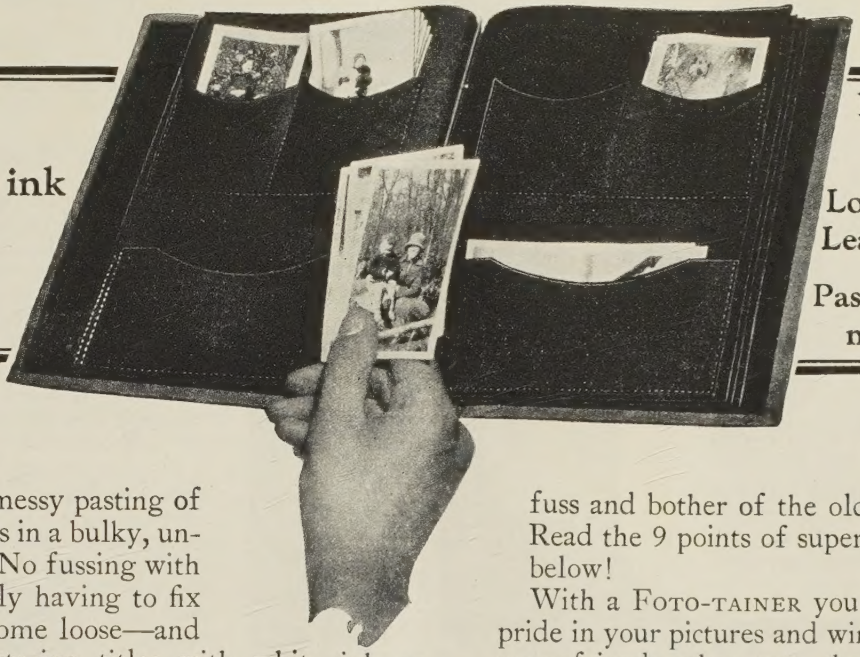

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SEND NO MONEY

THEN—*after* you make this FREE EXAMINATION—if you do not find this the best way you ever saw of keeping snapshots, send back the FOTO-TAINERS at our expense within 5 days and owe nothing. Otherwise send remittance within the trial period for the ones you decide to keep. Mail coupon—without money—today to MEVI, Room 1940-A, 420 Lexington Ave., New York.

9 REASONS

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Special groups kept together

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Keeps six times as many prints as an album

New leaves can be added

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FOTO-TAINER comes in 3 sizes and 3 qualities

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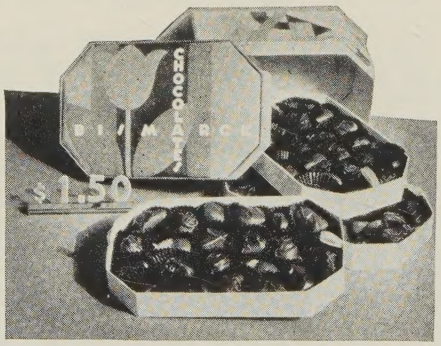

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BISMARCK HOTEL
RANDOLPH AT LA SALLE
CHICAGO

Edited By
ELEANOR WALKER

Holland

For the traveler who likes to sit on a barge and watch the wide sky with an occasional but not too strenuous interest in the life on and along the waterways, there's no better land to visit than Holland. You can see the whole country *via* the canals; and if any particular place or people interest you, you may stop and linger until your mood is for another lazily moving vessel. The tempo of the Netherlands is slow and unhurried, and before you know it, you have acquired the habit of worthwhile leisureliness.

It is a scene that is mostly water and sky, more sky than water, with a finely etched line below of church spires or windmill wings that gently, without too much accent, ties Nature down to man. There is something very restful about so wide a horizon, uncluttered by detail and illumined by that blond light that makes the Dutch landscape so indescribably lovely.

About the Dutch people themselves, their homes, their markets, and their towns, is that most enviable of atmospheres—livability. It may be only the milk cart with its round containers of brass and copper, polished and shining so as to reflect the life of the street; or a gaily-painted barge with flower boxes here and there; or a cow barn with the floor sanded in colors arranged in patterns and muslin curtains at the windows of each stall; or a vegetable wagon with carrots, cauliflowers and radishes, arranged with all the art of a jewel display. All things are treated with loving domesticity.

Even the Dutch school of painting reflects this absorption in things at home—the landscapes of Ruysdael, the genre pictures of Van Hiew, the lovely Dutch girls of Vermeer.

Dutch architecture, not of the modern school, but of previous centuries, is extremely individualistic. The park is the center of each Dutch town, and grouped near by are the Stadhuis, often with a winged stairway outside, the weigh house with its bulb-like cupolas, and frequently a dominating cathedral of the earlier days. Patina is hardly a correct word when applied to brick, but there is a purplish cast about the red brick of these buildings with their white stone trim that suggests age.

But the most charming phase of Dutch architecture are the streets of houses, with the zigzag lines of steep gabled roofs. Idiotically quaint seem these roofs. Within, the house fairly gleams with cheer, the panelled and painted walls, the spotless hearth, the wall bed all spell a much-beloved dwelling place.

There are certain towns you will wish to know particularly. The Hague with its park, its buildings and quiet repose; Delft,

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"Perhaps you will be interested to learn that I have succeeded in selling a short story to 'War Birds,' aviation magazine, for which I received a check for $100. The story is the first I have attempted. As the story was paid for at higher than the regular rates, I certainly felt encouraged."

Darrell Jordan
Box 277, Friendship, N. Y.

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Why don't you write?

the most charming town in South Holland; Rotterdam because of its ships from all over the world; Leyden, that dignified peaceful site of the university; Dordrecht because of the views of the typical Dutch landscape; Alkmaar for its cheese market.

Easter is, of course, the advantageous time to be in Holland. Then you see at Haarlem the most gorgeous patchwork of flowers. Anemones, hyacinths, tulips, crocuses and lilies arranged in huge squares, divided by canals like interesting seams. At Boskoop the nurseries have a greater variety of flowers, less mathematically arranged. Tulips have played so romantic a part in the history of Holland that at least one bulb firm has a complete library on the history of the tulip.

The Dutch have claimed their country from the floor of the sea; and with the greatest diligence and practical engineering skill, they stoutly maintain their right to it, throwing against the sea, their perpetual enemy, great dunes and dikes. Having and holding so precarious a foothold, they keep their country swept and garnished inside and out, with loving assiduity. It is delightful to become a part of such an environment.

Child and Universe

To attempt to explain the universe from the viewpoints of both the scientist and the poet within the brief space of one book might seem like an impossible task, yet Bertha Stevens of the Avery Coonley School, Downer's Grove, Illinois, has accomplished it in *Child and Universe*. This volume has no parallel. Its 250 pages of excellent writing and quotation and its unexcelled 48 full page illustrations are used by Miss Stevens to put in the hands of teachers and parents the means of impressing the child with the oneness, order and beauty of the cosmos, and to guide its mind to a scientific yet aesthetic concept of the relation of man to the whole. Just as a maestro utilizes brasses, wood-winds and strings, each for their particular effect, to express a musical idea, so has the author of this unusual book taken the best of poetry, the finest quotations from scientific writings, and the most significant of her experiences as a teacher to explain and make thrilling the mysteries of the universe. The volume is not for the child, nor for those parents who shove a weighty tome in the hands of a child whenever it asks a question. It will be effective, however, when the intelligent teacher or mother allows its inspiration to penetrate her mind and its fund of suggestion and information to be a basis for explaining the world to son or daughter. It is published by the John Day Company for $3.75.

"Electric Welded" Trees

Lightning is responsible for the "fusing" of two cottonwood trees in Holladay, Utah. One cottonwood, struck by a lightning bolt, fell into the crotch of its neighboring tree, where they grew in a natural graft. To prove this conclusively, a Nature lover cut off the top and bottom of the smaller tree, leaving only a twenty-foot log lying in the crotch. For years the log has been producing a vigorous growth of branches and leaves, showing conclusively that the graft was a genuine fusing of the two capillary systems.

SHAKESPEARE'S
ENGLAND

For all times Warwickshire dominates the literary life of England. Lovely Henley-in-Arden is an old country town which was once hidden away in the great Forest of Arden. Royal Leamington Spa known as the green heart of England because it cherishes a great oak which marks the traditional center of the land. At Kenilworth the most famous baronial ruins mark the place where the Earl of Leicester spent more than five thousand dollars a day welcoming Queen Elizabeth in 1575.

At Stratford-on-Avon is the first house of the literary world—where Shakespeare was born, perfectly preserved in every way. Stratford still retains its Mop Day when oxen and pigs are roasted in the streets. Summer festivals reproduce with utmost fidelity the character of the masterpieces of the famous bard. In nearby Shottery is the romantic thatched cottage beloved by the poet and Mistress Anne Hathaway. Harvard House in Stratford was built by the maternal grandparents of John Harvard.

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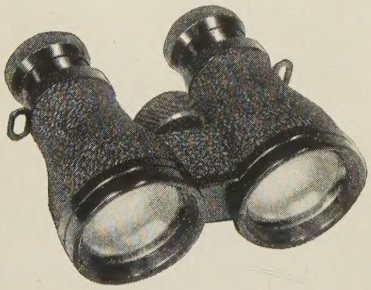

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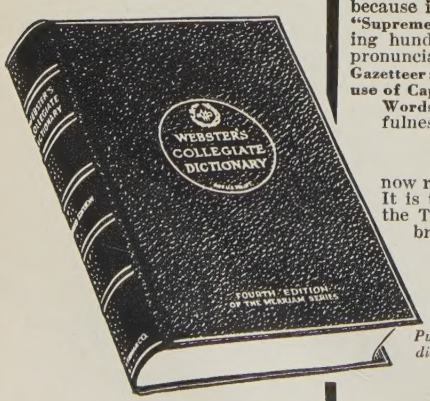

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Pot-Hunters

The pot-hunter is classed by true sportsmen and Nature lovers with those who rob church-boxes and take money out of beggars' tin cups, but what rank is to be given to those hunters that wait outside National Park boundaries to shoot down the unsuspecting animals as they come from their summer feeding grounds to the lowlands? These gunners are appearing with increasing frequency each fall and winter, and have created a situation of great concern to National Park officials. Their activities are described in the following excerpt from an editorial in Glacier National Park *Nature Notes:*

"I have known of so-called sportsmen who linger in a settlement adjoining a park until bad weather forces the unsuspicious and half-tame elk from the safety zone where food is covered by snow. These elk are as easily slaughtered as if they were domestic cows grazing in a pasture. I have known these same trophy-mongers to entice tame deer across the park boundary with a loaf of bread. These deer, suspecting no evil from hands from which they had been taught to receive nothing but good, are heartlessly murdered. Anything to get that trophy to hang on the wall of one's den! With what swelling of pride can such huntsmen gaze at the mute head of the victim of their prowess!"

It has been suggested that game preserves be created along the boundaries of parks to prevent such slaughter, but unless such refuges were large enough to include all the winter feeding grounds, they would mean only that the boundaries along which the hunters wait would be pushed back a certain distance. We are more inclined to feel that such tactics are matters for the sportsmen themselves to deal with, in order to preserve their own reputations. Unless by the force of public opinion such practices can be stopped, the designation "hunter" will have so unsavory a connotation that few will wish openly to acknowledge their connection with the class.

A Wise Lion

An aphis lion that ran amuck in a herd of ant cows, killed four and escaped safely before the enraged husbandmen could destroy him is the subject of an interesting Nature observation by Jessie Landes of Flora, Indiana. Miss Landes noticed on a bitter-sweet vine a large number of huge black aphids, and running about over them a dozen ants—the herd of ant cows and their guardians. Two days before she had brought home an aphis lion; so she put him on a leaf of the bitter-sweet. He suddenly stopped as if startled, then made a leap toward a huge cow, seized her and, holding her aloft, began to devour her. The cow began to shrink and the lion to swell and develop bands of color. In about two minutes the victim was just a bit of skin and was tossed aside. The attacker at once seized another, and repeated the process until four were dead. The ants by this time had discovered the raid, and rushed madly about, swarming over the lion. They must have bitten him, Miss Landes thinks, because he began to twitch and squirm, then ran up the railing out of danger. In no way could he be coaxed to return to the feast.

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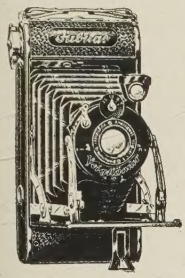

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Saving Wild Life

The comments of the late Dallas Lore Sharp in his recently published article, "The Master Word," on the fate of wild life under the wheels of the automobile have inspired several readers to write of their own experiences. Cary A. Rowland of Flushing, New York, tells of several accidents and near accidents he witnessed:

"We were motoring up the shoulder of a mountain on the Roosevelt Highway when I noticed a male American goldfinch fluttering in the road before me. I paused, but he was reluctant to leave, and no wonder! The body of his mate lay lifeless, the victim of some swift car.

"I carried the little dead body to one side to attract the male from the road, and then went on, while the goldfinch kept vigil over his lifeless mate. How loyal, risking his own life to be near the form of his loved one, thinking perchance that he might still help!

"Last autumn a gray squirrel was crossing the highway with a green walnut in his mouth as I approached. He became confused and started back. I pressed the brakes quickly and the little chap changed his mind, dropped the walnut, and scurried across the road to safety. Meanwhile, a car which had been following me too closely rushed by, the driver cursing about the narrowly avoided accident."

If all motorists displayed the same concern over wild life on the highway as Mr. Rowland, the toll of animal and bird dead would be far less. Drivers owe a responsibility to Nature and its children when they travel, although few of them realize it or appear to be willing to assume it.

A Survey of Mammals

An orderly concise picture of the mammal world and the interrelation of its members is presented in a small book recently issued by the New York Zoological Society and arranged by Claude W. Leister, Curator of Educational Activities at the New York Zoological Park. It contains one hundred pictures of the important types of mammals and a brief textual discussion of their salient points and their relationships. Far from being an attempt to compass the vast amount of knowledge in the mammal field, its purpose is merely to lay the ground work for an orderly, systematic approach to the subject. It is a real contribution to teachers and educators, and serves the layman with a casual interest in animals by helping him to organize and relate his observations. The title is *Present Day Mammals*. The distribution centre for the volume is the New York Zoological Society, New York City.

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NATURE MAGAZINE is published monthly by the American Nature Association. Entered as second-class matter May 31, 1927, at the post office at Washington, D. C. Additional entry at Greenwich, Conn.

Publication and Editorial Office, 1214 16th Street N. W., Washington, D. C. Additional Offices of Publication, Greenwich, Conn.

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BALANCES

An Editorial

DURING the past two years we have been existing in a condition that generally is described as a "depression." It has been marked by unemployment, want, financial collapses and political upheavals. In a word it may be said that all this has come to pass because economic balances have gone awry. Certainly it is not the function of Nature Magazine to indulge in analyses of economic problems, or to propose solutions. Nevertheless it is not such a far cry from the world of economics to the world of Nature if one stops to think it out.

The fundamental wisdom of Nature is something that Man has not yet been able to apply to his own complex affairs. And an essential part of that wisdom is described in the phrase "balance of Nature." Natural life, left undisturbed, is both immensely complex and tremendously simple. It is complex in the multiplicity of forms of flora and fauna that go to make up the whole. It is simple in the checks that these forms exercise upon one another to maintain the even balance of the world of Nature.

When the Mormon pioneers settled in the midst of the West and planted their crops for the next year they did so knowing that these crops must prosper or they would starve. After their seeds had flourished into plants and the future seemed assured, there came a plague of insects, ravening the fields and laying them bare. The future seemed black when out of the sky came a host of gulls. They fell upon the insects and ate heartily, decimating the ranks of the predators.

To this gift of Nature the people erected a column adorned with gulls in stone and marble. They dedicated this pillar in grateful remembrance. But these gulls did not come at the behest of a Mormon prayer. They did not come out of any desire to save the pioneers' crops. They came because there was an excellent meal to be had in the new sprung fields of the new settlers on the plains.

Whether in the world of insects, mammals, birds or fishes, Nature has provided predators and prey. Decay in the world of plants eliminates the old and useless and, at the same time, enriches the new and useful. Animate wild forms wax and wane in abundance in accord with the needs of Nature's balance. It is all beautifully planned and automatically executed.

This is, of course, in the wild world *left undisturbed*. Over most of the world Man has upset this balance of Nature just as he upsets his economic balances. He has destroyed forests to the point of extirpation. He has killed birds at the expense of being overrun by pests of insects. He has shot and trapped mammals to the point where their natural prey have become nuisances and menaces. He has gathered flowers at the cost of esthetic enjoyment, placing too little value upon this phase of human existence.

Thus has man meddled with the balance of Nature, ignorantly or wilfully upsetting it to his own loss and confusion. Yet, in the process, he has gained knowledge of the wisdom of Nature's methods. He has learned how Nature, let alone, will keep the ship of wild life on even keel.

In his social and economic life, however, Man has no such facility. He fosters extremes. He allows human existence to range from plenitude to want. He concentrates power and wealth. He permits—even encourages—unsound manipulations. In a word, Man has proved himself incompetent.

Nature knows no such inability. She checks overproduction. By so doing she assures even distribution of opportunity to survive and to prosper. Her system cannot be upset by any other manipulation than that of Man—the master bungler. As he becomes wiser then, Man can learn much from Nature that will help him to see his own problems in their true proportions. In fact, this he must do.

THE GREAT BEAR MAKES A CATCH
OF SALMON FOR LUNCH

NATURE MAGAZINE

VOLUME 19 FEBRUARY · 1932 NUMBER 2

BEARS OF ADMIRALTY

WITH THE BIG BROWNIES AND GRIZZLIES OF SOUTHEAST ALASKA

BY ARTHUR NEWTON PACK

ILLUSTRATED WITH ENLARGEMENTS FROM MOTION PICTURES

FIFTY yards, forty yards—thirty; straight toward the camera-laden trio came the grizzly, snarling as he rushed. Film buzzed through the cameras in Bill Finley's and Mrs. Pack's hands. Hasselborg, the guide, brought his gun to his shoulder for action. He barked a sharp command.

"Stop that, boy! Stop it! *Stop it quick!*"

If his words had been bullets, they could not have been more effective. Slithering and sliding on the beach, the huge animal brought up short, shaking his head in surprise. For a moment the circling gulls and the winter wrens saw a queer sight etched against that tidal marge where Admiralty Island joins the Pacific. Across ninety feet of mud and mussels, in the gathering dusk, the three humans and one thousand pounds of disconcerted grizzly stared at each other. A few feet to seaward, teeming salmon were splashing in the shallows; to landward a chill wind that drove a fine rain before it was moaning through the forest, where scudding clouds came down to meet the trees.

Suddenly, the spurt of courage that had inspired his charge deserted the bear. He turned tail and ran a few yards, then stopped to gaze sulkily back at the trio, as if debating his course. Then he slowly walked toward the shore, punctuating his retreat with glowering looks at his conquerors. At a safe distance, he paused to scratch himself nonchalantly—as if to show he wasn't afraid, then continued his lumbering gait to the edge of the beach. There he sat down, dog-like, to watch.

Only then did Hasselborg give the command to march. Slowly the three walked to their canoe, stranded on the beach, and began to push it down the shallow channel toward home. As they moved away, they could still see the grizzly, blurred in the rain and

In this article, Mr. Pack, president of the American Nature Association, tells the first of a group of stories resulting from the expedition of last summer. Many adventures marked the six-week trip of the party, which included Mrs. Pack and William L. Finley, to Alaskan waters. Tumbling glaciers, strange bird hunts, whale thrills, will be described in the subsequent articles.

AUTHOR PACK PREPARES FOR A SHOT

Waiting with ready camera on a gravel bar for a bear to arrive

AND HERE COMES A BROWNIE FROM THE BUSHES

He walks out on a log at the head of the riffle to look things over

HASSELBORG'S TWO-ROOM ESTATE ON ADMIRALTY

Here the guide lives and at the right we have him in the full splendor of his most excellent beard

dusk, sulking on the beach like a whipped child. Only when he had disappeared in the gathering darkness did any one speak. "Whew!" murmured Bill. "Let's give thanks for His Master's Voice."

We who had come to Admiralty Island—a day's run by gas boat from Juneau—to camera-hunt the Alaskan bears, had many opportunities to give thanks for that voice, and its owner, before our days of adventure were over and our little yacht *Westward,* laden with thousands of feet of motion picture film, turned its nose south toward Seattle. Al Hasselborg knows bears. The year around he lives in a little two-room cabin built with his own hands near the mouth of Mole Creek. He guides hunters and otherwise lives the ordered life of a lone bachelor. And sometimes at dusk of a summer day the bears come to fish near the cabin, while he sits there, smoking and watching—because Hasselborg would rather watch and photograph a bear than shoot him. This wise, rugged, weather-beaten old guide with the full long beard is worth a story in himself; and he is an essential part of this tale, too, for without his aid the experiences we had and the pictures of bears we took could never have been. And without him, too, some of us might not have returned, for many were the thrills the big brutes gave us during our two-week stay.

There are perhaps two thousand bears on Admiralty Island, and not a black among them,—just big brownies and grizzlies. Bears are the largest carnivorous animals left in the world today, and those of Admiralty are nearly as large as the famous Kadiak bear, a species limited to Kadiak Island. Specimens weighing more than one thousand pounds and standing from seven to nine feet tall on their hind legs have been taken on the Alaskan Peninsula and the southeastern coast.

During the spring these great animals live up among the snow-capped peaks, eating grass and roots and minding their own business. Then, in late July, they drift down to the banks of the streams, where the salmon are madly spawning, to enjoy a rich diet fresh from the icy waters. Then it is that the camera hunter should seek them out.

It was one day in late July that Bill Finley and I, paddling our canoe, came to that cabin. We had left the good ship *Westward,* with Mrs. Pack and other eager bear hunters on board, moored a few miles out in Mole Harbor. We were to be the first contingent of bear hunters—the rest should have their fling later. Hasselborg made us welcome; there on the cabin floor we spread our beds to sleep a few hours until, in that black darkness just before dawn, our guide awakened us, as he stirred about cooking the breakfast mush.

Soon we were lined with that lasting nourishment; we pulled on our rubber boots, and, as the sky brightened, stepped into the rushing stream just outside the cabin door. Our guide seemed to know every hidden and projecting rock beneath the surface of the tumbling water, and stepped easily from one foothold to another, while we stumbled behind him. He carefully plucked off every frond of fern or branch of devil's club or alder that might brush against us,

OFF AT DAWN ON THE CAMERA HUNT FOR BEAR

Hasselborg leads the way and Bill Finley follows through the creek mouth

to kill our scent, and always had us step upon bare rocks or in the water, and, after crossing fallen logs without touching them with our hands, to splash them with water to wash off any possible scent.

Our cameras were in packs on our backs, and Hasselborg carried a heavy .405 rifle to be used only if we met a bear that had been previously shot at and remembered his hatred of man. Frequently at sharp bends in the stream he would wade well out and peer cautiously around, having no wish to come suddenly upon a big grizzly or brownie unawares. The guide's precaution instilled confidence rather than fear. We knew he had no desire to be mauled by an injured bear. That had happened once when he was collecting for a museum and was endeavoring to kill the animal without injuring its important skull.

About a mile above the cabin we came face to face with our first brown bear. He stood at the edge of the

A STUDY IN THE INDECISION OF BOOH-BEAR AND POOH-BEAR

Above they come wading down the creek together; then they engage in debate about whether to go on or not; below they stand up for a last look

BILL FINLEY AND HASSELBORG BEHIND A LOG BLIND

A watch set up at the strategic junction of two creeks to await the appearance of fishing bear or bears

stream, apparently about to wade in after a few salmon that were fighting their way upward across the shallows to a spawning ground. If you have ever read A. A. Milne's story about Christopher Robin and Winnie-the-Pooh, you can picture for yourself this comical creature as he tried to make up his mind whether to run at us or away from us. His front legs seemed to want to go down stream towards the photographers, and his back legs seemed to want to retreat. Whenever a movie camera buzzed, the hind legs won out and Pooh-bear darted back. When the buzzing stopped, Pooh-bear quite evidently said to himself, "Now I will be brave and bluff these humans." He would make about three steps forward and then that buzzing camera grated on his nerves again. For several moments these ridiculous antics lasted; then the hind legs won the battle, and Pooh-bear bounded up the bank to the safety of the bend, about 100 yards distant, facing the rushing current.

Hasselborg spoke in a low tone, "Watch him! There are a lot of fish in that pool, and he is going to catch one!" The sound of the human voice disturbed the bear not a bit. The great creature took a nonchalant step or two up stream, abruptly wheeled in his tracks, and dashed down the riffle where the giant dog salmon were spawning. The bear caught one salmon under his paw, while the other fish splashed away in terror. A moment later he put down his head and lifted it with the struggling creature in his mouth, then strolled casually into the brush to finish his meal. Perhaps three or four minutes passed. Once more he came out of the thicket and sauntered up stream on the opposite side from the blind. Finley's camera was buzzing continuously, but I held fire with the focus set at fifty feet, to be ready for emergencies should the animal come closer.

THE GRIZZLY LOOKED UGLY AND CAME RIGHT ON

"He is going to charge," said the guide, "I'm afraid I'll have to shoot"

"STOP IT! STOP IT!" SHOUTED THE GUIDE

The bear halted in the middle of his charge and plunged off to the right

alders. A hundred yards ahead another teddy bear that might have been Pooh's brother appeared under a big tree. The first Pooh-bear had been a lovely rich brown, while this one was darker—almost black. He, however, did not wait for his picture.

We continued on up the stream to a natural blind made by a fallen log, and here settled ourselves for a long wait. At last a big brown grizzly appeared at the

The grizzly could see the photographers now, but refused to be disconcerted. Straight on he came at a leisurely gait, while Finley shot foot after foot and Hasselborg went through strange contortions, trying to sight Bill's still camera. This was no Pooh-bear. The guide estimated, in a whisper, that his skin would measure ten feet. Although brown, he was more like a Montana grizzly, with a long, ugly nose and a disagree-

MOTHER BEAR AND CUB EMERGED ON THE CREEK BANK

They came out of the bushes and ambled along, giving us a fine opportunity to photograph the pair

able expression, and lacking only the marked hump on his shoulders. He was so full of fish that his belly almost dragged. It was apparent that he resented the camera, but was just too full to do anything about it. On he stalked to a point fifty feet from our blind, then swept off the stage to the tune of buzzing cameras, headed, as Hasselborg told us, for the mountains to sleep off the results of his gluttony.

As the day now wore on it began to rain, and as the dampness soaked through us we amused ourselves by watching the salmon, which were splashing over the riffles, flopping, twisting, fighting ever onward up the stream. The silver horde was coming in. The procession was endless; the striving beyond anything else in the world.

Overhead the eagles sat and watched. Once a large mink dashed across the stream. The winter wrens sang almost incessantly. But we were listening for hoarse croakings of the ravens, for these great black eaters of offal follow the fishing bears, and betray their presence with their raucous cries. At last, however, the rain became too heavy for photographing, and we went back to the cabin, satisfied with our first day.

By the fire that night, Hasselborg exploded another common bear myth—that bears sit on rocks in streams and scoop out salmon with their paws. "I never heard anything so ridiculous," he fumed. "They always catch them in the way you saw this morning. They dash out into the riffle and put one paw down on the salmon—if they're quick enough. Then they grab the fish in their mouths and walk off. Anybody who tells you anything else is crazy." We mentally noted a number of would-be scientists for asylums.

The next two days were uneventful. Then we moved the yacht to the mouth of Swan Cove and made it the base of operations. I had twisted my shoulder, which kept me from hunting, and Mrs. Pack, who had been waiting for her turn, took over my cameras.

One day the hunters got into the canoe and paddled to the head of the cove. The tide was going out, but there was still enough water to reach the farther shore. As they landed the dense flocks of Bonaparte gulls that had lined the flats rose with a great clattering, ravens croaked, and crows, which had assembled as if a feast was soon to take place, noisily protested. The dozen or so bald-headed eagles that were soaring or perched upon isolated mussel-covered rocks wheeled away. The three, with cameras adjusted for instant use, started across the flats toward the mouth of a little creek. Before they had reached the semi-protection of the tall

THE BIG GRIZZLY AMBLED UP THE SAND BAR

It was easy to see that he had a full meal of salmon in his sagging belly

HE SEEMED TO BE WALKING RIGHT INTO THE FINDER

In another moment it seemed as though I could reach right out and touch him

waving sedges, first one big brown head and then another rose in the midst of the waving grasses. Like two huge woolly teddy bears out of some children's book they looked. Then they caught the human scent, and were off at full speed, their humping brown backs appearing and disappearing above the grass as they sped toward the protection of the timber. The first creek proved barren of salmon— hence of bears—so the little party went on to the next, where near the edge of the tall blue-gray spruces and by the side of the rushing stream, a halt was called and the three hunters crouched in the midst of the grass and cow parsnips. There they constructed a hasty blind, cutting down the tops of any grasses that would be in the way of a clear view of any bear that might come out of the woods or across the flats. They prepared for bears only in the direction from which their scent could not be detected.

Hardly was the blind completed when Hasselborg whispered, "There comes one from up the stream!" Sure enough, a huge dark shadow ambled along nearer and nearer, emerging finally from the woods and stepping out on a great log that lay across the stream about fifty or sixty yards away. But soon he retraced his steps. He had caught their scent. Time passed, and no bears came. It was late in the afternoon when Hasselborg decided that they could risk going up the stream before it grew too dark. The wind now blew from the side, and any animals that might be ahead would be liable to get the scent. Putting each foot down with care, the hunters worked their way up over the slippery rocks, through riffles where the salmon shot out from under their feet with nerve-racking suddenness. They had hardly gone a hundred yards when, from a thicket not twenty feet ahead, a low growl met them. Hasselborg handed his haversack frame to Mrs. Pack and pointed his rifle. Another growl; and another. Hasselborg whispered that it was either a mother with cubs or a bear that had been wounded. Quietly they edged away to the other side of the stream and along the edge of the opposite woods, Hasselborg keeping his rifle aimed at the point of the thicket, ready for any sudden charge; but Bruin was content with the warning, and they continued cautiously unmolested.

A PAIR OF LESSER YELLOW-LEGS

Feeding along the edge of the tidal flat near Hasselborg's cabin

A DEER CAME ALMOST TO THE BLIND

It ambled daintily down the creek, unsuspicious until almost on us

Hardly fifty yards farther Hasselborg stopped suddenly. All three hunters looked directly into the face of a brown teddy bear, not thirty feet away. There they stood, the bear peering from the woods in surprise at the three motionless humans in the stream, while the three equally surprised hunters stared at the bear. Hasselborg was plainly worried—had the bear charged, he could not possibly have been stopped in that short distance. As for the camera hunters, they were too disappointed to be frightened—the animal was too much in the shade to photograph.

Then as suddenly as he had appeared, the bear faded from view. He might have been the Cheshire Cat himself, so quietly did he vanish.

Just then a salmon leaped from under Mrs. Pack's feet with a resounding splash, and she jumped as if she had been shot. Hasselborg spun around with his gun pointed, and Finley poised for flight. For a moment there was panic, then the ridiculousness of the situation struck the three; every bear on Admiralty must have heard their laughter. Indeed, it might have been so, for no more animals were found along the stream that day. The bears had not yet come down from the mountains in full force. Signs showed that they had been feeding mostly on sedges and blueberries, but once the presence of light hairs revealed where a fawn had died. At Mole Harbor we had found similar evidence that the bears had caught beaver.

It was just as the disgruntled hunters emerged at dusk on the tide flats on their homeward journey that they met the bear that Hasselborg's voice stopped, and with which we introduced this story. There, about one hundred yards beyond the stranded canoe, and a quarter of a mile away from them, a medium-sized

HE EDGED TO THE BANK, LOOKING HUNGRY

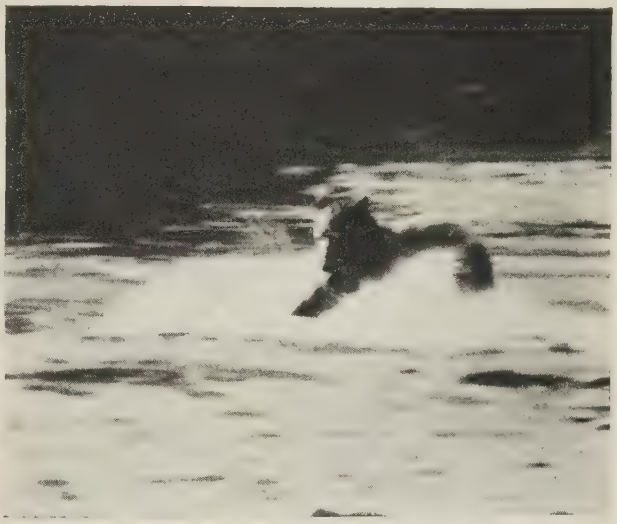
There were fish in the stream and his appetite was keen, humans notwithstanding

SUDDENLY HE MADE A DASH INTO THE WATER

He had spied a pair of salmon spawning only twenty feet from the cameras

HE DASHED MADLY IN AFTER A LUSCIOUS MEAL

Certainly there was no lack of food in the stream where the fish come to spawn



HE GATHERED HIMSELF TOGETHER FOR THE LEAP

Down came his right paw, successfully pinning the salmon to the bottom of the creek

STILL HOLDING THE SALMON WITH RIGHT PAW

He turned slightly, put down his head and grabbed the captive in his jaws

AND NOW THE MEAL IS AN ASSURED FACT

So with it grasped securely by the head he walked off into the alders to eat

grizzly had emerged and was walking boldly out onto the beach. They decided to stalk him, as the wind, for once, was right. A bear has poor eyesight and might even mistake the three people for another bear. Under directions from Hasselborg, Mrs. Pack and Finley crouched low, hunched their heads over, and moved in single file behind the guide, so that the bear could never see more than one form approaching. Like a gang of convicts they went, in lock step, toward the unsuspecting mammal, first crunching over the mud and mussels, then splashing through the shallow water. At last the bear lifted his head and looked. Then he continued to waddle slowly toward the channel where the salmon splashed. Not until the hunters were within one hundred yards did he stop to consider. Still the procession kept on, never changing its gait. The bear sat down and scratched himself to appear unconcerned, but it was plain he was puzzled. What was the steadily advancing bulk? Fear seized him when about eighty yards intervened, and he started for shore on a dead run. Water splashed in all directions beneath his flying paws. Finley and Mrs. Pack raised cameras and began to shoot. The bear hesitated, doubled his speed, then he stopped again. By this time he was over two hundred yards away, and the camera hunters lowered their cameras with satisfied feelings. It had been a good picture, with plenty of action—the best of the trip.

Suddenly, without warning, the bear changed his mind. He would not be outbluffed by this queer-acting thing. He'd show it, he would. On a dead run he went back toward the channel, the water flying beneath him as he galloped. At his goal he raised himself on his hind legs to look out on the bay. He'd let this unusual enemy see what a big bear he was! Then he dropped down on all fours and prepared to fish for salmon, but all the time he kept one eye cocked around to see how this maneuver was working. The humans stood still. They did not seem impressed. This was just too much! The grizzly flung around. He stood up again to show his fighting strength.

Then he charged. Hasselborg aimed his gun, and Mrs. Pack her camera. Finley's was already going. With terrific speed the bear came, snarling as he rushed. Then it was that the guide's cool voice turned the charge of victory into ignominious defeat.

There was still to be one more adventure for the three hunters that day. As they paddled their canoe toward the yacht, another grizzly was sighted on the shore, so they steered close in. The grizzly refused to be bluffed and continued calmly along, until Finley shouted, "Come on out and fight!", whereupon he gave two bounds and was out of sight. The hunters reached the yacht about nine-thirty, shouting as they came, "Ten bears and a growl!" Excitement reigned.

The ten-bears-in-a-day record remained unbroken for some time. There were many days when we saw no bears at all. There were others when we sat with our feet in the water and the rain trickling down our necks, hour after hour, without shooting a foot of film. But at last the weather cleared. One morning Hasselborg, Finley, and I made our way up a stream to a small grass-covered islet or gravel bar from which could be seen a long straight stretch of riffles just right for spawning salmon and fishing bears. Here the larger camera with nine-inch lens was set up on the tripod. Handfuls of grass and an oilskin jacket were tied up to form a sort of blind, and we settled down for the day.

Waiting in a blind for twelve hours may be a most tedious proposition. Certainly there had been enough of it lately. However, on this day the gods smiled. The fog lifted; the sun shone on the riffles; and then came a brown bear. He walked deliberately into the creek, sighted the hunters and sniffed, but the wind carried the man-scent away. He retired to a log at the far end of the riffles to think it over. Then, without warning, he charged at full speed down stream directly towards the cameras. How the water flew! Frantic salmon dashed about, adding to the spray. To all appearances, we in the blind were about to be eaten alive; but the guide was cool. His hand grasped the still camera, not the gun. He knew bears and was perfectly sure that this one merely wanted a fish and had decided to get it, in spite of the human beings on the gravel bar. The bear tore on. Crash! The right paw came down on a dog salmon and kept it helpless there while the bear wheeled about on that foot as on a pivot, turning his back to the cameras. Down came the great head, seizing the fish. It flopped in the bear's jaws, and he put up his left paw to steady it and to get a better hold. Then with the silvery prey gleaming in his mouth, he strolled over to the bank and was lost to view in the alders. Finley groaned. "There, he went and turned his stern end around so the picture won't show the fish properly," he muttered. However, the whole rush had been photographed with the camera at double speed, and the scene had taken sixty feet of film.

"Hey!" whispered Finley. "Bear up stream!" This one was very dark—almost black—as compared with the one we had photographed. He, too, retired to the log at the far end of the riffle. Then he came on the run. Probably he had not seen us at all. What he wanted was fish, and he pursued a big dog salmon down and down until that crashing paw landed on the quarry only about thirty yards from the camera. If Finley had objected to the previous performance, he could not complain now. The bear turned sidewise and stood with the flopping salmon in his jaws in the full sunlight, so that his every action was fully recorded.

It grew hot on the gravel bar. For the first time since leaving Seattle we sought shade; but the only shadow was beneath the tripod. With watching and drowsing by turns, we passed the hours. Our watches showed five o'clock when the long vigil was rewarded by the appearance of another brown bear. This one missed his first fish, but pursued another to within forty feet of the blind, where he, too, posed on his hind legs.

"Say, Hasselborg," I remarked, "how about a little variety? Remember, you promised to show us bears two and three at a time."

The guide grumbled. "Well, the salmon aren't right this season. If there were more (Continued on page 130)

THE YOUNGSTER TAKES A BIRD'S-EYE VIEW OF THE WORLD

There are few more charming sights in bird life than that of a young flicker pertly peeping from the door of his home

FLICKERINGS

SITTING IN ON THE HOME LIFE OF AN INTERESTING BIRD

BY R. A. ROMANES

ILLUSTRATED WITH PHOTOGRAPHS BY THE AUTHOR

WHAT wanderer by the countryside has not halted to gaze at a bird with beautiful golden-brown plumage, as he sweeps in undulating flight through wood or orchard, revealing spots of jet scattered over his delicate chocolate-colored breast and a crescent of gorgeous crimson that caps the back of his head. To those who know, it is the golden-winged woodpecker, or, to call him by the most familiar of his several dozen local appellations, the flicker. To those to whom, unfortunately, birds are a mystery, it is a lovely flash of color.

Though naturally a shy bird, the flicker in seeking a tree in which to establish his home will not infrequently take fancy to one standing in close proximity to a dwelling, and, if not interfered with, gradually accustoms himself to his human neighbors. Ordinarily, the nest-hole is excavated fairly high up, but sometimes it is so low down that a forest rambler can conveniently peep in.

THE BLIND

The vantage point for obtaining these photographs

The flicker illustrations here are of a bird that elected to construct his domicile nine feet up a decaying Spanish oak, down in northern Georgia. And a tough piece of work it was, too, for him to dig out that nest sixteen inches deep with a three-inch entrance-hole. It kept him busy for a full four weeks, during the latter half of which he put in as many as twelve hours of work a day, starting early and sticking to the job until dusk. In general the labor of nest-building is fairly shared by the female bird, but it was scanty aid our flicker got from his mate, who evidently disliked carpentry and shirked whenever she could do so.

HAVING A LOOK AROUND . . . .

. . . . THEN IN HE GOES, HEAD FIRST

In Georgia, laying takes place any time during the first three weeks of May. The eggs, white and glossy, are laid early in the morning, one each day, until the set, consisting generally of five eggs, is complete; sometimes there are only four; occasionally six or seven. The flicker has been known to raise a second brood in the same year, but this was not the case with our friends, and such an occurrence is certainly exceptional. Like most birds the flicker is not easily startled during the period of incubation, remaining indifferent to little molestations which at other times would have immediately scared him from the spot. When once the writer, intent on investigations, flashed a light into the nest, the female did not budge, as could be observed through a small spy-hole previously drilled through the trunk into the nest; nor did the male show any agitation on a subsequent similar occasion, remaining unperturbed on the nest, with broken egg-shells protruding all round—truly an odd sight, but a beautiful and interesting one as well.

For the first eight or ten days the callow birdlings with their big heads and thick beaks looked decidedly weird. Unlike the infant of the red-headed woodpecker, which exhibits no red at all on its crown, traces of crimson can be clearly discerned on the flicker baby's head after the first few days. For a fortnight one of the old birds spends the whole night with the brood,—in this case it was the male,—and he could be observed stirring about and peering out of the nest at dawn, though he rarely leaves the hole till half an hour later. Then the day's task begins, and from 5:30 in the morning until 7:30 in the evening the parents are incessantly foraging for food, each trip from and to the nest averaging from half to three-quarters of an hour. Until the fledglings are about three weeks old the parent birds clear out of the nest after almost every meal, but soon the size of the youngsters is such as to crowd the nest so that it can no longer be scavenged. This nest-cleaning is carried on with much circumspection, the wary parent first spying around

OVER THE EDGE . . . .

. . . . AND A LAST FLIP OF THE TAIL

from the hole and refraining from collecting and ejecting the nest-trash until it is certain that there is nothing suspicious about.

The considerable depth of the nest is a safeguard against intrusion. It also serves another purpose, the high walls providing ample sleeping accommodation; for, like other woodpeckers, the flicker does not crouch, but hangs when he slumbers. Prying furtively into our flicker's habitation late one night, through the spy-hole already mentioned, the writer with the aid of a flash-light was delighted to catch a glimpse of four little flicker juniors hardly three weeks old, all fast asleep with the head tucked under the wing, and clinging to the sides of the nest almost like suspended bats.

There are few more pleasing sights in bird-life than a young flicker, at last fully fledged, pertly peeping from his window, taking his first "bird's-eye view" of the great wide world around him. But these flicker youngsters are an obstreperous lot without a doubt, addicted to impatience, expressed by a querulous "Yee-up", which is the first of the flicker's several calls that the young birds acquire, usually after about sixteen days. Little insects and grubs of various kinds, also small fruits, such as huckleberries, compose the juvenile flicker's diet. Ants and their pupae are specially relished. As the time approaches for the nestlings to leave their nursery, an authoritative "Yee-up" of the old birds becomes frequent, and the progeny can be observed at the entrance-hole, each little one eagerly craning his neck and listening attentively to the parental command, impatient withal to test his sturdy wings. At last one daring young fellow can resist the "call of the wild" no longer and, pushing his companions aside, essays with uncertain flight to reach his parents, guided by the direction of the sound. But it may be half an hour or even a full hour before his brother can muster the necessary courage to follow, and so a couple of hours or more may elapse before the whole family, one by one, has vacated the

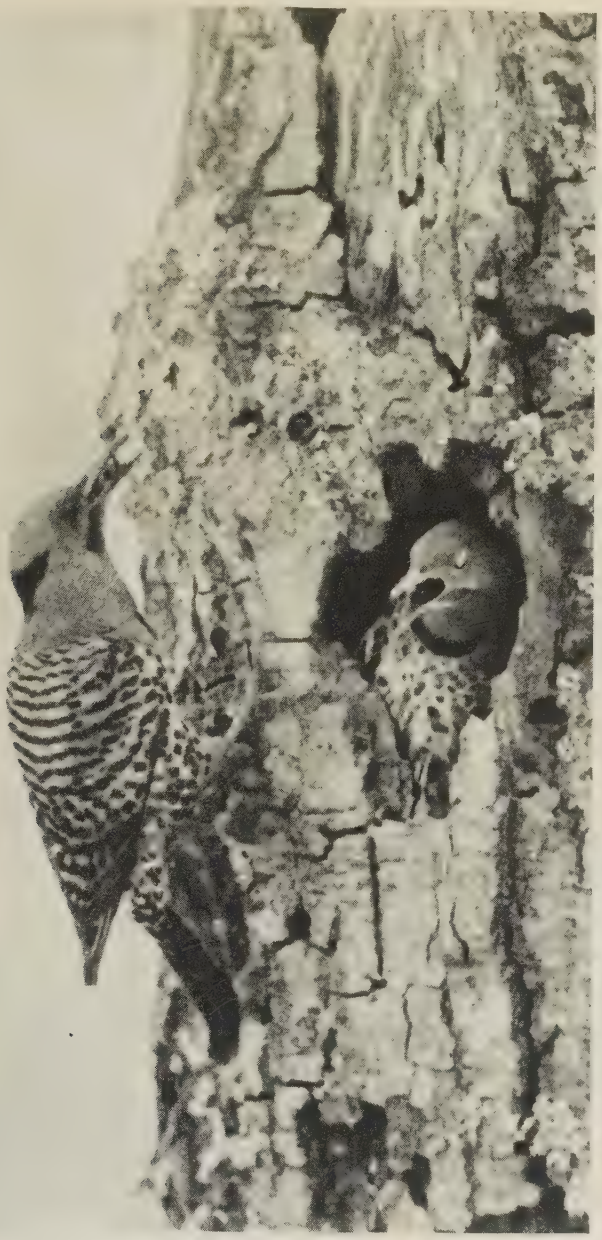
A MARAUDING CAT INVESTIGATES
Happily the nest cavity was deep enough to defeat him

THERE LIES WITHIN THE NEST
The flicker egg shining whitely on the chips and slivers in the home

nest. The young flickers are now fully three weeks old and measure eight inches from the point of the beak to the tip of the tail.

Flickers sometimes return to the same nest in consecutive years, and in early spring may be observed examining the previous home, evidently discussing its merits as an abode for another season. Being of a peaceable disposition they are occasionally deprived of their prospective quarters by other (even much smaller) birds in search of a residence. Our Georgia flicker was in the second year unfairly ousted from his domicile by a pair of bluebirds, who had discovered a passage thereto through the rotten wood at a lower level. After a brief squabble the flickers gave in and departed. But Fate was in their favor! The nest of the robber bluebirds having been espied and destroyed by wanton urchins, our flickers promptly returned, true to the familiar tree. Last year's nest was carefully inspected, but now pleased them no longer, so the male bird set to work to excavate a new nest-hole at twice the distance up the trunk. Obviously such faithful adherence to the old spot was deserving of reward in the form of practical aid, so with auger and chisel in hand the tree was scaled and our flicker helped along at his task, a good-sized aperture being made at the place where the bird had just started to bore. This assistance was appreciated and our industrious flicker followed it up with nearly a month's hard

CLEANING OUT THE NEST
The flicker caught shooting out on the wing with refuse in its mouth



AH, MORE HUCKLEBERRIES FOR JUNIOR

Father brings up another course in his bill for the hungry, waiting offspring

THREE HUNGRY MOUTHS AT MEAL TIME

When the youngsters are growing the parent birds have their bills full filling demands

work, and in that space of time scooped out a cavity twenty inches deep.

To facilitate study of flicker life, the writer now sawed the nest into sections, afterwards replacing these removable members and fastening them with suitable catches. It was surprising how little all this tinkering disturbed the flickers; it seemed almost as though they felt themselves to be in friendly company, for evincing no uneasiness, they diligently removed such chisel chippings as had remained in the nest, and, giving the bottom of the cavity a final touch to suit their taste, the happy pair quietly settled down in their new commodious home.

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In the March issue of Nature Magazine will appear the first of two articles by William Beebe. Needless to say these are written with all of the charm for which this gifted scientist and writer is noted. The stories are based on the recent Bermuda Oceanographic Expedition and will later appear as two chapters in the book resulting from this expedition.

THE ALLIGATOR FROG ON HIS NIGHTLY PERCH

WAITING FOR THE INSECTS TO FLY NEAR

THE FROG WITH AN ALLIGATOR'S VOICE

BY FRANCIS HARPER

PHOTOGRAPHS BY THE AUTHOR

IF WE have bestowed the names of alligator gar and alligator terrapin as an indication of the size, strength, and voracity of certain animals, there is similar propriety in proposing the name of "alligator frog" for a recently discovered species from the Southeastern States. In fact, the frog is entitled to such a designation for still further reasons. It not only lives in fairly close association with the alligator, but it also has a voice strangely similar to that huge reptile's.

Rana heckscheri did not receive its technical name from Wright until 1924, and so far it has gone without a common name. It is exceeded in size by probably only one North American member of its genus—the common bullfrog, *Rana catesbeiana*. A specimen of about average size in my collection is a little over four inches in length and weighs about three-eighths of a pound.

The upper parts of this noteworthy frog have a soft brown ground color, approximating that of dead leaves; they also bear numerous blackish spots and blotches, these being especially large and distinct on the outer side of the legs. Some individuals are heavily marked below with a brownish slaty hue on a white ground, while others have little of this mottling. Both front and hind limbs have a conspicuously robust development. The frog's large and placid eyes, according well with its confiding or unsuspecting temperament, are its most attractive feature. With these protruding, laterally-directed orbs, which give it a divergent vision, it regards the world about it with a quiet, unwavering gaze. The iris suggests a ring of burnished bronze with a thin golden inner rim.

The alligator frog lives in southern Georgia and northern Florida, where it is distinctly a species of the rivers and creeks, haunting wooded swamps along their edges. It loves waters with a gentle current, generally shunning those that are still or have an imperceptible flow. Thus I have found it on practically all sides of Okefinokee Swamp—in the St. Mary's River on the south and east, and in Suwannee Creek on the northwest—but it has never been observed in the quiet waters of the Okefinokee itself.

SUWANNEE LAKE, WHERE WILD LIFE TEEMS

The home of alligators and alligator frogs, numerous birds, fishes and insects

Suwannee Lake—merely a slight expansion of Suwannee Creek—is an incomparably fine place for studying the rather remarkable habits of the adult frogs, and here I have given them considerable attention during the past three seasons. In the dark waters of the lake, however, I have failed to detect the huge and strikingly marked tadpoles, with which I be-

came acquainted in the St. Mary's River in 1921, and in Alligator Swamp at Callahan, Florida, the following year.

Despite its close relationship to such a decidedly aquatic species as the common bullfrog, the alligator frog is not only largely terrestrial, but even semi-arboreal to an extent probably unknown in any other North American species of the genus *Rana*. Though I have never observed it more than a few feet distant from the water's edge, it habitually spends the daylight hours on some elevated perch, generally from one to three feet above the water. This may be a tussock, on top of which the frog occupies a little nook among dead sticks and stems of shrubs; it may be a hollow stump; or it may be a cypress knee rising from the edge of the lake, with such shrubs as *Pieris nitida, Cyrilla racemiflora,* and *Arsenococcus ligustrinus* springing from its upper sides and top and forming a screen for the creature. Last July I found one on such a cypress knee day after day. It posed most accommodatingly for its photograph, not even budging as I pulled, broke, and cut away some of the sticks and stems in front of it. The regular respiratory pulsation of its white throat and an occasional twitching of a hind leg as a gnat crawled over it seemed to be the extent of its movements while I was near. How it attained its perch, three feet above the ground, on its daily ascents, is something I fain would have learned. The sides of the cypress knee were nearly vertical, and the shrub stems near the top must have been as much of a hindrance as a help in the ascent. Probably the frog cleared the whole distance with one mighty thrust of its stout legs, for a gradual scramble up the sides of the knee would be scarcely within the powers of a *Rana*. Another individual, discovered in a hollow stump, had no difficulty in clearing the rim, twenty inches above, at a single leap. Perches of this sort keep the frog fairly well out of the range of such terrestrial enemies as hogs, turtles, and snakes, and also screen it from such feathered foes as red-shouldered hawks and barred owls. When disturbed from one of these perches by a human intruder, it plunges into the lake and disappears.

IN A SAFE NOOK ON A CYPRESS KNEE

A day-time position several feet above the water. Here the frog is protected from birds of prey as well as from enemies in the water and on the ground

If the alligator frog, besides having regard for its primal needs of food and safety, were responsive to agreeable sights and sounds, it would have additional reasons for taking up its abode on the borders of Suwannee Lake, one of the prettiest bodies of water in the South.

A morning in early May reveals this spot at its loveliest. The narrow waters lie beneath a bright blue sky, with fleecy patches of dazzling white cloud drifting lazily across it from the direction of the distant Atlantic. On either side the close ranks of tupelo, black gum, and cypress, with foliage then at its greenest, spread a grateful shade over the edges of the lake as well as upon the damp black earth of the adjoining creek swamp. The birds of this leafy tangle are happy and vocal, and a pleasant succession of their notes falls upon the ears of the understanding listener—the liquid chant of the prothonotary warbler, the merry roundelay of the Carolina wren, the buzzing trill of the parula warbler, the vociferations of the crested flycatcher, an occasional "speel-yup" from its lesser cousin, the Acadian flycatcher, the querulous "sham-shack" of the redbelliedwoodpecker, and now and then the clarion cry of the lordly pileated woodpecker. A catbird, lingering late on its migration, sings a few low phrases from the shrubbery near the shore, and a fast-moving shadow on the lake announces a silent turkey buzzard sailing overhead. Fleets of "mellow bugs" or whirligig beetles, thousands strong, disport themselves on the coffee-colored waters, and among them a flotsam of countless fallen tupelo blossoms drifts before the breeze. Swirling mudfish constantly break the surface. The biggest alligator of the half a dozen present makes a lazy tour of the lake and finally crawls partly out on its favorite log. A few cracker fishermen paddling here and there and casting their lines about add an interesting human element to the scene. And the alligator frog, if so minded, can take in all these things from its observation post upon the shore.

When darkness falls upon the lake, our frog exhibits a marked change of behavior, for it then descends from its perch and takes up a position directly by the water's edge. A moonless night in July is thus an appropriate time for making a census of the alligator frogs about the lake as well as for obtaining glimpses into the ways of various other animals that lead an active part of their lives under the cover of darkness.

As I paddle quietly along the shore, with an electric searchlight strapped to my head, I feel a hunter's thrill in detecting creatures of the night by means of their

retinal reflection, or "eye-shine." All up and down the shore hundreds of spiders' eyes sparkle like diamonds with a brilliant bluish light. Here and there a pair of eyes, with a glow like that of yellow flame, indicates either a southern toad or an alligator frog, and by paddling near enough to distinguish the rest of the animal, I establish its identity.

When I turn the rays of the searchlight away from the land, over the lake's surface, I generally find a pair or two of alligators' eyes, with a glow like red embers, moving soundlessly and eerily along. Dazzled insects fly into my face, and a fluttering bat passes close by, now appearing in the light, now vanishing in the darkness. Meanwhile one jackfish after another, bewildered by the glare, leaps madly about; one clears ten feet through the air before splashing down, and another strikes the gunwale beneath my hand with a most startling thump; several even land in the boat and spatter water about until tossed overboard with a paddle. Now a short-nosed gar is clearly seen as it swims near the surface. An occasional "ctung" of the green frog is heard, but the present drought and low water provide the alligator frog with no inspiration to bellow. A Florida barred owl sounds its uncanny notes in the adjoining swamp, but this time it does not reveal itself or its eye-shine, at which I have marveled on other nights as certainly to be that of a very fiend.

While these little nocturnal adventures have been taking place, the round of the lake is completed. Only seven or eight alligator frogs have been counted, for there is no plebeian abundance of this elegant species. Presumably all, or nearly all of them, have left their retreats of the day and are squatting motionless but alert along the shore, where the searchlight can scarcely fail to disclose their yellow stare. On one night, however, I was much surprised to find one individual still occupying its diurnal perch. Theirs is apparently a policy of patient waiting for such insects or other prey as may wander by within reach of an extensible tongue. Not one of them is actually in the water, though most of them are close enough to be reflected in it. It is evidently their wont to spend their nightly vigils in approximately the same spots, as I have learned by making the round of the lake on different nights.

And how does this frog, of aquatic structure and relationships, react when splashed with water from a paddle, or touched with the paddle itself? Each one thus experimented upon, instead of seeking safety in the water, turned and hopped away over the land. There was a partial exception in the case of my acquaintance of the cypress knee, now established for the night at its base. Perhaps because dazzled by the searchlight or hemmed by the paddle coming from the land side, it first splashed into the lake, but immediately scrambled ashore. Fear of alligators and mudfish, lurking unseen, may be a sufficient reason for avoidance of the water by night.

The bellowing season of this frog perhaps reaches its height in May, doubtless beginning some weeks earlier and continuing at least to mid-August. At the time of bellowing the temperature generally seems to range somewhere between 75° and 90° F. Though I have never quite succeeded in witnessing the performance, it may be safely assumed that it takes place invariably in the water. It is also heard for the most part during the day, in both bright and cloudy weather. The fact of daytime bellowing accounts for the difficulty of observing it; in the case of other frogs it is comparatively easy to approach behind the screen of a flashlight and watch their nocturnal performances. In May and June certain of these frogs, probably mostly males, are commonly seen by day in the shallow edges of the lake, instead of perching on tussocks or cypress knees, where I have found them regularly in July.

Even when heard within a few minutes of each other, the bellows of the alligator and the alligator frog have a noteworthy resemblance, so that fairly close attention may be needed to distinguish them. Of course the frog's note does not attain the enormous volume of the alligator's; it is less of a growling roar, and more of a deep, hollow rattle or guttural roll: "r-r-r-r-r-r-r-r-r-r-r-r-r-r." Each bellow lasts about two seconds, and is generally repeated several times with intervening periods of about one second. When one frog starts calling, that is often a signal for several others to join in a chorus. Did the progenitors of the species acquire the form and quality of these notes through listening to and imitating the bellows of their alligator associates?

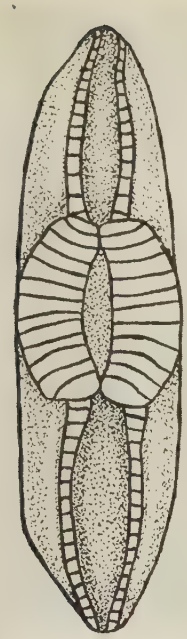
Aside from this mating "song," another note is frequently heard—a loud, startling, explosive snort, or snarling yelp, which might be represented as "yurrp!", or "burrk!" Several times I have noticed a frog snorting thus as it leaped away in alarm. Possibly this call is also given under less disturbing circumstances that so far have escaped an observer's notice.

The frog's bellow, with its general likeness to the alligator's, may have a similarly alarming effect upon the human listener. An illustrative anecdote is related by Hamp Mizell, the proprietor of Suwanne Lake, who extends his beneficent protection over nearly all creatures, both great and small, in that vicinity.

"A man frum Manor come hyere one time erbout three yé'rs ago, ter ketch catfish uv a night. I had a boat hauled up fer repairs; it had got good an' dry. I invited 'im ter sleep at the house, but he said no, he'd sleep in the boat. It uz erbout one erclock when he fust come ter my house, wantin' a gun an' some shells. There wuz somethin' down there growlin' at 'im an' jarrin' the groun' under 'is feet. I told 'im I didn' want ter give 'im a gun ter shoot some er my cattle er hogs, but ter come an' stay in the house. But no, he wanted the gun—all his things an' his fish uz down there. So I give the gun an' six buckshot shells.

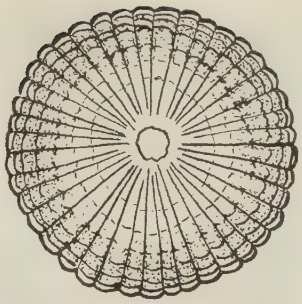
"Later in the night he come up by my lane an' went clean on ter Uncle Lone Thrift's an' spent the night with 'im. Carried the gun, too. I didn't see 'im again that night at all.

"It uz them strange kind er frogs down there, that beller ne'r erbout like a 'gator. They're not like the ordinary run er frog."



MOSQUITO EGG

At the left is the boat-like egg of this insect. It seems to be equipped with pontoons to aid it in floating



VERY DIFFERENT

The contrast in insect eggs is shown by the egg of the muscid-fly at the right and that of the cotton-worm moth at the left

INSECT EGGS

MANY AND VARIOUS ARE THEIR FORMS

BY MAURICE E. PHILLIPS

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All insects are developed from eggs. It is true that in certain groups of insects the eggs are never laid but hatch within the body of the female. The great majority of female insects, however, are capable only of producing eggs that are inclosed in a shell, and which hatch outside the body as is the case with the eggs of birds.

There is almost no limit to the variations in shape and external structure of insect eggs. Perhaps the most common form is an oblong or oval object that may be either straight or slightly curved, and which looks very much like a miniature jelly-bean. Spherical and flattened forms are also numerous, while types of odd or freakish appearance are not uncommonly found. In fact it seems that had insects the ability to produce eggs of any shape they wished, they could hardly turn out stranger types than they actually do. Some of these odd forms are obviously adaptations to some special condition. Thus the mosquito egg, which is laid on the water, is shaped much like a boat, and has air-chambers like pontoons on its sides. These assist in keeping it afloat. The surface texture of different kinds of eggs may be either smooth or rough. Many are decorated with prominent ridges or rows of bumps and depressions.

As efficient egg producers, insects are real prize winners, though the number of eggs laid varies in almost unbelievable fashion. Some species produce only a few—probably a dozen or less—which are usually laid one at a time at intervals of a day or more. The sheep tick, for instance, lays eggs with about the same frequency as a mongrel hen. Among other insects, particularly the bees, ants and other social groups, a single female often produces hundreds of thousands of eggs before she dies. In such instances as this there is a division of labor, and the queen devotes her entire energies to the production of eggs, being waited upon as a true queen should be.

EGG OF THE WALKING-STICK

It takes two years for it to hatch. Magnified 15 diameters

In laying their eggs, insects show a great deal of consideration for the next generation. With unfailing accuracy they place the eggs in situations suitable for the hatching young. It is almost certain that eggs will be laid upon any special plant that the larvae may require for food. If the young are aquatic, the eggs are laid on or near the water. Most insects that are parasitic place their eggs in or on the body of their host. The horntail, which is a parasite of the codling moth, deposits its eggs inside the cocoon of that pest. Ox warble flies pass their larval stage in the bodies of cattle. They lay their eggs on the hair of these animals, which, on licking themselves, take the eggs into their mouths.

There are many other interesting variations of egg-laying habits. A warble fly in Central America, the larvae of which burrow in the flesh of man, lays its eggs on the legs of a mosquito. When the

AN EGG-LADEN GIANT WATER-BUG

The mother bug lays the eggs in this fashion on the back of the father bug

OLD-FASHIONED POTATO BEETLE EGGS

These were laid on the "deadly nightshade", which belongs to the same family as the potato

mosquito alights to feed, the eggs hatch, being stimulated by the heat of the human body. The larvae descend the legs of the mosquito and enter the flesh, sometimes through the puncture the mosquito has left.

Some of the giant water-bugs take more direct care of their eggs, the female attaching them to the back of the male. He is then obliged to carry them about wherever he goes. It is said that the male heartily objects to being henpecked in this manner but is apparently unable to protect himself.

There is a wide difference in the ways in which insects actually deposit their eggs. Sometimes the eggs are placed in groups, perhaps systematically arranged in rows. Other kinds are placed singly. Usually they are more or less definitely attached to the surface where they are laid, though often this is not so. The aphis-lion or lacewing-fly places her eggs each on the top of a long silky filament, which is attached to a leaf. The lacewing, though a beautiful insect, has a very piratical bunch of children, which have a special taste for insect eggs. She, therefore, places her own eggs on the top shelf. When the young hatch, each slides down his individual pole, and never sees his embryonic brothers stuck up in the sky. In this way he is unconsciously saved from the sins of cannibalism and fratricide.

Many insects protect their eggs with different kinds of sacks or coverings which are put on after the eggs are laid. The tent caterpillar is an excellent example. The cockroach, however, lays her eggs already enclosed in a bean-like capsule. The inside of the capsule is divided into many cells or compartments, an egg in each compartment.

Insects often lay their eggs beneath the surface. Parasites may puncture the skin of other animals to deposit their eggs, while fruit-flies use their long ovipositors to place their eggs beneath the surface of fruit, stems or leaves. Some of the snout-beetles offer an interesting variation in that the female bores a hole in a seed or nut with her snout. She then lays an egg and pushes it to the bottom of the hole with her snout. The chestnut weevil has a particularly long proboscis, which it uses for this purpose.

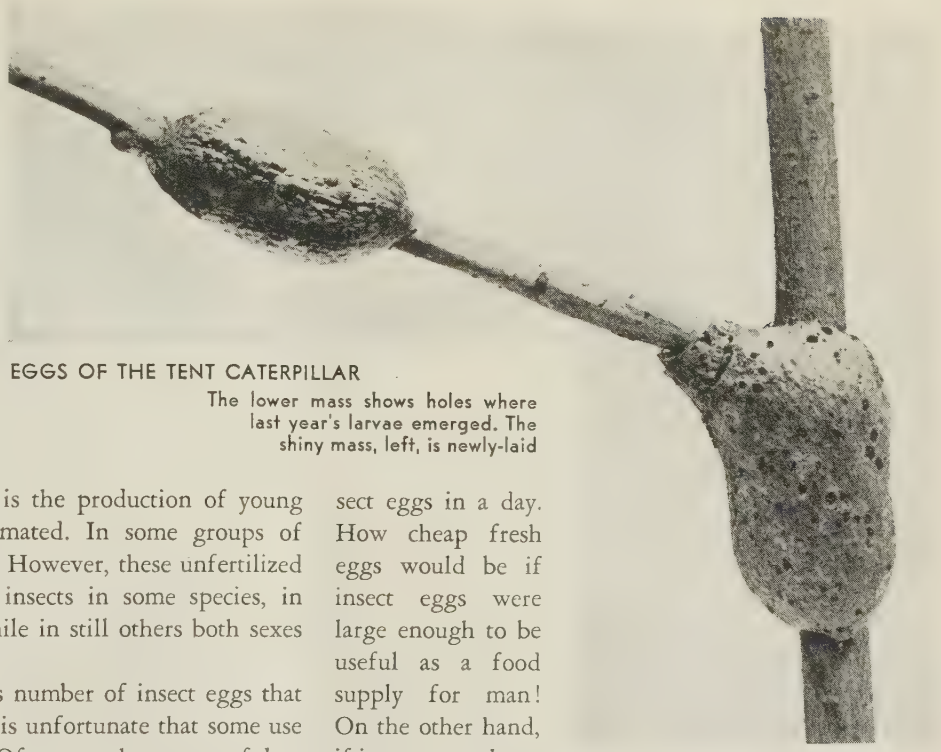
Insect eggs pass through an incubation period after they are laid. This does not mean that they are sat upon or even that they are tended but simply that they must pass through a definite period of time before hatching. The length of this incubation period depends largely upon the species and to a lesser degree upon conditions such as temperature and moisture. It varies greatly. In some species it may last only a day or two at the most, although it has been stated that the eggs of the common walking-stick require two years to hatch. Many of our common insects pass the winter in the egg stage, others

THE LACEWING-FLY AND ITS EGGS

These are placed out of harm's way, each on top of a silky filament attached to the leaf selected

practically the entire year.

Though nearly all types of insect eggs hatch into a single individual, there are certain of the Hymenoptera which are known to produce many young from each egg. In one species, the remarkable average of 163 was found to result from a single egg. From the eggs of other species two individuals are known to develop.



EGGS OF THE TENT CATERPILLAR

The lower mass shows holes where last year's larvae emerged. The shiny mass, left, is newly-laid

Another very interesting type of insect development is the production of young by females that have not mated. In some groups of insects this is quite common. However, these unfertilized eggs hatch only into male insects in some species, in others only into females, while in still others both sexes are produced.

Considering the enormous number of insect eggs that are deposited everywhere, it is unfortunate that some use cannot be found for them. Of course they are useful as food for birds, though it is more accurate to say that birds are useful because they eat insect eggs. As small a bird as a chickadee is said to eat as many as 4000 insect eggs in a day. How cheap fresh eggs would be if insect eggs were large enough to be useful as a food supply for man! On the other hand, if insects were large enough to lay eggs of that size, we would probably have to use shotguns instead of sprayers to control them and might really be in danger of extinction.

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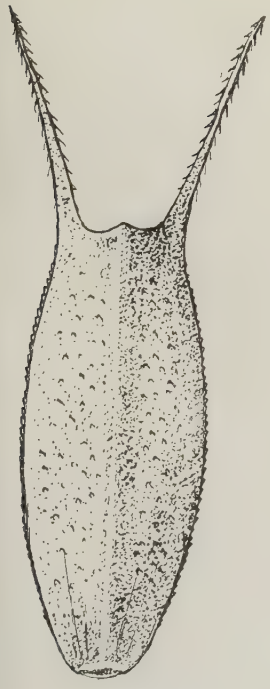
BURS OF COMMON PLANTS

BEING THE FIRST OF A SERIES OF ARTICLES ON THE DIFFERENT TYPES OF BURS ONE OFTEN COLLECTS — UNWILLINGLY —ON WALKS

BY SALOME COMSTOCK MILLER



STICK-TIGHT

Its other name is beggar-ticks, and it is about one half an inch long

People who frequent woodland paths and country roads are often unwilling gatherers and distributors of the seeds of various kinds of plants. Returning from a walk in such a place, with several different kinds of seeds clinging to his clothing, one is prone to wonder by what sort of plants they were produced.

One group of burs are all members of the thistle family. They are very closely related, and are quite similar in appearance. The burs in this group are all one-seeded. They are all produced in heads as in the sunflowers; but often the head is almost spherical, and the burs extend each in a different direction.

The nodding bur-marigold is found in almost every part of the United States. It is a rather low plant, although in some cases it may reach a height of about three feet. It is found in wet places. The leaf is stemless and undivided excepting for the notches on the edge. The flower is yellow and inconspicuous, and the seed is flat.

Beggar-ticks, or stick-tight is somewhat similar, but grows much taller, sometimes reaching a height of nine feet. The leaf is composed of from three to five leaflets. The plant grows in moist soil, and is rather generally distributed throughout the country.

Spanish-needles, another of the group, is a common roadside weed. It is a more delicate looking plant than the bur-marigold or the beggar-ticks. The seed, like that of the beggar-ticks, is four-sided. It is another sticker that comes home with you.

A COMMON BUR

The nodding bur-marigold, which is three-eighth inches long. The spike is shown in detail at the upper right. Notice the notches on the edge that insure the seed's firm grasp on anything it touches. Bur-marigold grows in all parts of the United States

WASHINGTON—WHOSE MEMORY WE HONOR

A photograph of the famous Houdon bust selected by the U. S. George Washington Bicentennial Commission as the official picture of the Father of his Country

HONOR TO WASHINGTON

BY CHARLES LATHROP PACK

PRESIDENT OF THE AMERICAN TREE ASSOCIATION

AS A NATION united, this United States of America now enters the George Washington bicentennial year; the two hundredth anniversary of the birth of the man who led a disheartened colonial people with widely varied interests to unity under one flag. The struggle was the struggle for a principle. The world watched the outcome. The surrender at Yorktown meant much more than the turning over of a sword by one man to another. It meant not so much that a revolution of one group against another group had been successful, as it meant a revolution in political and governmental processes. There is a statue of this man in the capital of the empire he defeated in battle. There are statues of him in dozens of other countries. There are colleges and avenues, libraries and memorial buildings named for this first American.

The George Washington Bicentennial Commission is furthering many plans and programs by which Washington may be honored during this bicentennial year. It will send anyone outlines of what can be done in marking this birth date. There will be pageants and plays with colonial settings; there will be radio, school and church programs beyond number. The celebrations will turn the thought of millions to the man and to the events that made this nation possible. Of all anniversaries, this is the one above all others in which the individual has a part. This part is through tree planting. There may be little of the sound of trumpets or the thrill of parade in this phase of the marking of the bicentennial, but in the planting of the tree the individual has set up a memorial that is alive; a memorial that will outlive the fanciful parade and the picturesque pageant of the moment; a memorial that by its rugged stand against storms will be a silent, yet living reminder to another century of what Washington hoped and planned for the new country. The tree will also be a living memorial to the citizenship of the planter.

This tree planting army, being registered on the national honor roll by the American Tree Association in Washington, now has recorded upward of twelve million tree plantings dedicated to the memory of the Nation's first president. Around thousands of these trees school children, members of women's clubs, the Daughters of the American Revolution, garden clubs, civic organizations, Scouts, Camp Fire Girls, the Masonic Fraternity, and thousands of individuals will join in dedication programs in 1932. The individual may place a little flag in the earth that bosoms his tree and gives it life. He may not have anything to say or, if he does, says it to him-

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self. But what a tribute! This tree planting army welcomes the individual to membership as warmly as it does the organizations that are planting Washington memorial forests. The American Tree Association will give a certificate of membership in the tree planting army and register the name of the planter on the national honor roll not only as a tree planter but as a good citizen; the citizen who looks steadfastly ahead through the fog of petty differences and "isms" that sway to every wind; the citizen who looks ahead, just as Washington did at Valley Forge, with a steadfast mind on the main thought of the whole bicentennial program—America.

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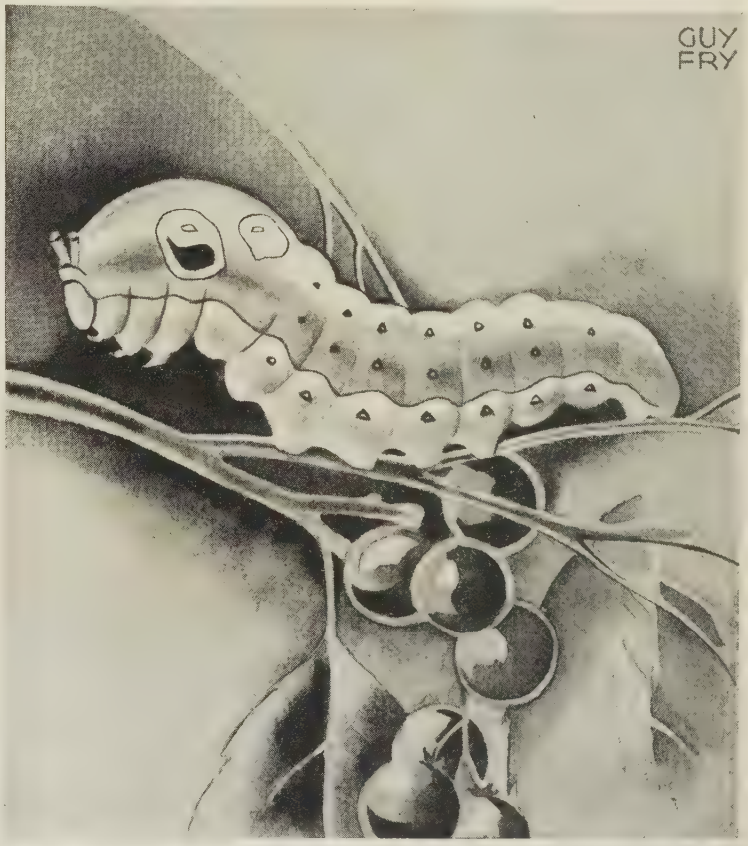
A NATURE ABSURDITY

LARVA OF BUTTERFLY LIKE A GROTESQUE FISH

BY GUY FRY



IMAGINE THIS CREATURE SIX FEET LONG!
With his queer markings, he looks like a grotesque fish or ancient sea monster. But he's harmless, and later turns into a beautiful butterfly

WHEN I first came upon the larva of our tiger swallow-tail butterfly I was torn between laughter at the comic quality of the thing and admiration for the cunning artifice of Nature.

The first impression of the creature's unusual features is of their resemblance to a grotesque fish. They remind one of a baby-grand model of a pre-historic sea serpent, especially when the insect is enraged to the point of projecting its horns. This is its mode of defense, or at least its method of discouraging a would-be enemy, for a sickening odor sufficient to lay the ambitions of even a human is emitted from these horns.

Its none too thrilling color scheme is made up of a deep yellow with shadings of light brown on top and a moist flesh color on the under side. The "horns" are two fleshy tubular affairs that can be projected and withdrawn at will from an aperture near the top of the small head. A thin brown line runs from the tip of the head over the back to the end of the abdomen. Six segments of the abdomen are marked by two small black spots on either side of the brown line and one on each side of the abdomen below another thin line that runs the length of the body. A seventh segment carries a black spot on either side of the dividing line at the top of the abdomen and one on either side of the body.

But most striking of all are the two markings that occur on either side of the third anterior segment near the top. These resemble two large eyes, and give the creature its ludicrous appearance.

Imagine the larva without these markings and no unusual sight appears, but with this added master stroke of Nature it becomes an object that can bring a gasp from the person seeing it for the first time. Its usual length is from one and one-half to two inches. Imagine how awe-inspiring it would be if it were several yards long! Its abdomen tapers toward the end and its thorax, which resembles an immense head, is broader than the rest of its body and gives the entire caterpillar the appearance of a miniature cat-fish.

The larva feeds upon the foliage of the wild cherry or that of any other tree that is handy and it is curious to see the thing, head and thorax upraised, nibbling at the fibrous leaf that it holds within its three sets of legs while it clings to the branch with its pro-legs.

Of the several caterpillars that present an almost fearsome sight in our country lanes and city streets I think this larva of the *Papilio turnus* probably takes the prize.

MORE BARNYARD ANTICS

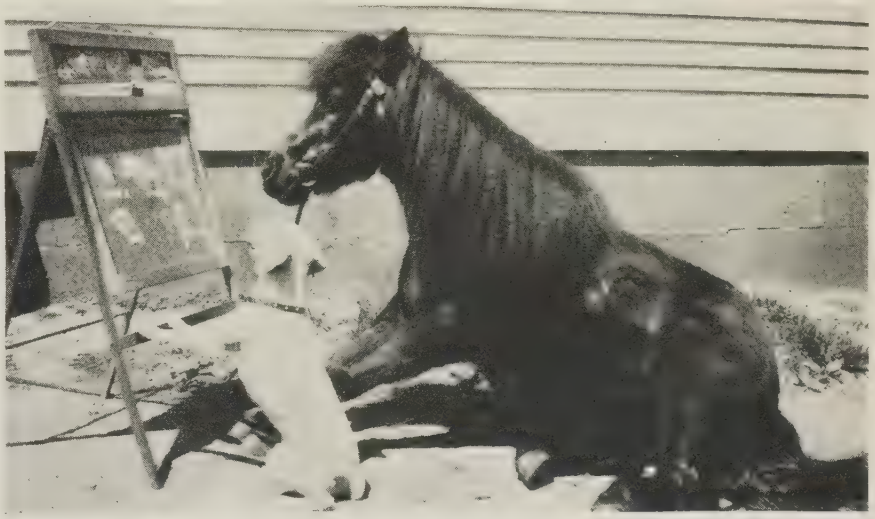
ALTHOUGH the physical background of these pictures is usually merely the side of a barn or the clapboards of a house, there is another background—that of patience, kindness and understanding. When Mrs. Joseph Watson sends us a new collection of snapshots made in her barnyard up in Yalesville, Connecticut, we are unable to resist them. And the enthusiasm with which previous groups of these pictures have aroused among our readers seems to indicate that we are not alone in the matter.

So here are ten more events in the lives of this extraordinary group of animals. Laddie definitely proves that the business of blowing soap bubbles is not a game that can be played by youngsters alone and he seems to be in a state of suspense waiting for the bubble to break, as most bubbles seem to have a way of doing. Meanwhile Pepper, the cat, has set up in the photographic business and, with a

good subject, seems about to make a successful negative; after which he has his washing to hang out.

We are curious to know just what kind of a feline secret Laddie is being let into. Perhaps it is some inside dope on the whereabouts of the neighbor's dog that has been pestering the cats. However, all is peaceful when Laddie and his big playmate lie down to rest with Pepper and watch the white rats and kittens.

Tea for two is in order for squirrel and rat and to entertain at this event Laddie reaches what is apparently a very high C. Laddie is a man of parts and takes over the responsibility of teaching Blackie, the pony, the three R's, from which he adjourns for a fast game of checkers. Then he is all tired out from his mental and physical exertions and certainly has a free ride coming to him through the kindness of the goat whose name, Mrs. Watson avers, is Woodrow.



We have resolved that some day, when our travels take us near Yalesville, we are going to visit this remarkable barnyard menagerie. We want to find out just how Mrs. Watson manages to get the confidence and co-operation of her camera subjects.

THE CONFERENCE—Here, on two stalks of seed grass, we see perched a tiny field mouse and a grasshopper who are in deep conference on the possibilities of the amount of damage they may effect with the crops; or, perhaps, they are discussing where they may store their provisions

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THE HANS CHRISTIAN ANDERSEN OF THE PAINT BRUSH

BARON ERNST VON MAYDELL PORTRAYS NATURE'S FAIRYLAND

BY DOROTHY PLETCHER

ILLUSTRATIONS COPYRIGHTED BY THE ARTIST

THIS STORY is remarkably like a fairy tale. It takes place in Russia and the hero is the son of a Russian nobleman.

Playing in the grounds of the large family estates, collecting beetles and butterflies and wild flowers and storing them away in the castle where he lived—this, with his interest in outdoor sports, occupied nearly all of our hero's time in his youth. This boy was no other than Baron Ernst von Maydell, the famous artist.

When the clouds of the World War gathered over his country, the boy naturalist had grown up. At the outbreak of the Russian difficulties, he joined the Russian forces, and in 1915 was participating in the World War. Like many others, he discovered when the War was over

FOUR GENERATIONS—This picture is filled with the artist's symbolism. It depicts youth bothered by the mosquito; then at an older age; next the moth and the flame, and, finally, old age, with the seed going on into other generations for other plants. In the lower right are two tiny creatures, made of little flower parts, who are batting and blowing a seed about, playing, as it were, with the great game of life.

that he could not enter his homeland and that his estates and fortune had been taken from him. Penniless and disheartened, he found himself facing that age-old problem of how to earn a living.

Attempting to forget their great misfortunes, he and his wife bravely took up their abode in the top of a tiny mountain hut in the Bavarian Alps, and there, turning his own life and interests to those of the Nature subjects nearby, Baron von Maydell began drawing and painting the mountain flowers and insects. His childhood fondness for Nature study had come indeed to his rescue at this dark moment. And it was about this time that one of his small pictures came into the hands of an art critic who recognized in it the work of a new artistic genius.

Throughout Europe scientists and art connoisseurs began buying his Nature pictures; Maydell calls them "Motifs Aquarelles," meaning motifs or stories in water color drawings. News of their existence crossed the Atlantic, and during 1929 he exhibited at the Detroit Institute of Art, in 1930 at the Baltimore Museum of Art, and in 1931 during November in Washington at the Corcoran Gallery of Art, and in December again at the Baltimore Museum of Art. Now art galleries and museums throughout America are clamoring to exhibit his work.

"These simple motifs aquarelles, from Nature," Baron von Maydell says, "were born of a distress deeper than I can bear to recall, and I had never, until 1919, seriously considered my childish pastime of drawing and painting

SUNDAY AFTERNOON—Along a stalk of bluebells comes Mother Bug with a flower for a parasol over her shoulder, and pushing her little lady bug daughter in a go-cart which is none other than a grasshopper whose long legs serve as handles to this tiny carriage. The daughter is wearing a fetching costume of red and black polka dots. Daddy Bug brings up in the rear with little brother

flowers, butterflies and insects, just as I found them in my wanderings. During my younger days my collection of butterflies, beetles, and bugs was the joy, the pride, and interest of my life. Now these memories find new joys for me in my new life's work."

Although he is absolutely self-taught and has never had any technical instruction in art—he never did a serious drawing until he was thirty-four years old—Baron von Maydell has evolved an amazingly unique and original art in his aquarelles which are a clever combination of scientific exactness, fantasy, Nature symbolism and humor.

As a naturalist who has become an imaginative artist, he now wishes to call our attention to the hitherto neglected home life of flowers and insects, and the happy and sometimes tragic life that exists in one's garden, or under rocks and roots by the roadside. And that is how, in his whimsical way, he has come to depict the family life of insects and flowers and the quaint, piquant Lilliputian people who live with them, according to the artist's imagination. No wonder he is called "The Hans Christian Andersen of the Brush," which he claims is his greatest title.

In his "Motifs Aquarelles," which are really fairy tales of Natureland, he would have us think that his little bugs are personalities who live an exciting life all their very own. However, the artist believes scientific accuracy is due their diminutive personalities and this is always of paramount importance with him in his work.

In his studio Maydell works at a very long, narrow table to the right of which are glass cases of living insects and flowers, to the left, a glass tank of fish and many of their minute aquatic relatives. And what paint brushes! The largest is composed of six hairs, the smallest of one hair! Although he makes exquisite drawings out-of-doors, he always does his color painting in the studio with his living insect and flower models about him. But to appreciate his superb use of color one must actually see these aquarelles, for mere words can give no idea of their ethereal loveliness.

For a holiday now and then the artist goes off to Hamburg to see the great Hagenbeck collection of animals, where he makes no drawings, but simply watches the zoo's tenants for days and trusts to his good memory for future use in his studio work.

When at work on a picture Maydell isolates himself in his studio with his tiny subjects and works with furor until he has finished his new-found theme. At one time when painting a new-born Luna moth, he surrounded it with wet sponges to keep it moist and then worked frantically for days, for had the moth dried and developed, it would have flown away, leaving the artist minus his picture.

Believing in the sincerity of his subjects, Maydell enjoys this artistic game of depicting the themes of life which he sees about him as he works in the Bavarian Alps, Switzerland or Italy, as fancy calls him hither and yon. His great happiness is to bring to those who see and understand his work, laughter—of that real and humorous nature that clings to one long after the pictures have been seen. Now, from his brush, he is sending his aquarelles far and wide, into castles, homes, schools and galleries, and is rapidly achieving fame as a portrayer of scenes in Nature's fairyland.

Baron von Maydell's own life has proved to be a true fairy story. And so, in real story book style, we all join with those who have seen his beautiful "Motifs Aquarelles" to wish that he and his wife live happily ever after.

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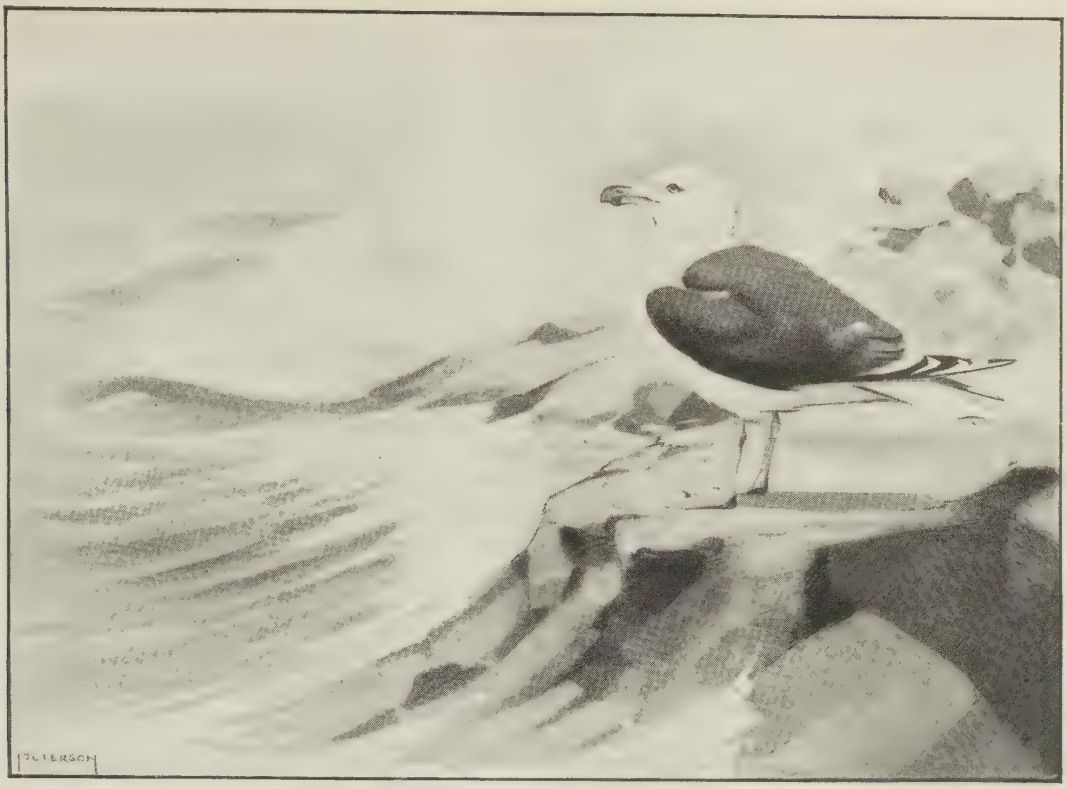


INTERESTING MEMBER OF THE WHITE-WINGED LEGION

Black-backed gull, often seen in winter off our northeastern coast, and easily distinguished by its dark mantle

HALF A MILE AWAY

FIELD CHARACTERISTICS OF EASTERN GULLS

BY ROGER TORY PETERSON

ILLUSTRATED BY THE AUTHOR

THE WHITE-WINGED legions that patrol our shores and waterways fill a place not unlike the position held by the "white-wings" of human society in the general scheme of things. The birds are the indispensable scavengers that clean and tidy the beaches. Whether one lives where the sea pounds on the sands near his door, or along some great waterway, or even near some small body of water in the interior, he knows them. The herring gull he knows best, but there are others besides, although they are not as a general rule so much in evidence.

The beginner in the field study of birds, fancying closer resemblance between the various species than actually exists, will often mistake the herring gull for one of the less common varieties. Bird students in the eastern interior will, for the most part, find their gull acquaintances limited to three species, the herring, ring-billed and Bonaparte's gull, unless they live near some especially favored spot, or are blessed by extreme good fortune.

To find good "gulling" in the East one must visit the more remote, outlying points along our Atlantic coast, preferably on the North Atlantic during the winter months, for most of the gulls are northern in distribution and reach us in greatest numbers during cold weather. Such a point that is especially favored is Montauk, at the tip of Long Island.

Although politically assigned to New York State, it lies far out in the sea off the New England coast. Block Island in Rhode Island is clearly visible in the distance. Nowhere on Long Island does the winter wind bite so fiercely, sweeping without hindrance across the cold Atlantic and striking this point with a fury and bitterness that in weather the least bit inclement makes birding an uncomfortable procedure.

To one who is "bird-minded" enough to have made the journey, it is well worth the discomfort. Off the point, in view of its commanding light tower, lie great beds of scoters of all three species. And there one finds, mingled with the other sea birds, troops of gulls resting on the rocky beaches, flying low over the waves or circling high above the restless water. The herring gull of course is the dominant species.

All of the gulls are increasing because of the protection they have been accorded during the past few years. With the growth in the numbers of individuals has come a corresponding increase in visits by the rarer species. This is unquestionable evidence of the success of or-

ganized conservation, to which wild life is always quick to respond. We might assume that the future of these, among the most graceful feathered creatures, is now secure.

At the same time those of us who are frequently afield with glasses, will accept the challenge of this increase in individuals and species. We shall want to recognize the gulls that are commonly observed; and we shall be even more interested in making identifications of birds that visit us out of season, or far from their accustomed ranges.

Most of these identifications are not difficult; indeed the major part of them may literally be made "half a mile away". Only a few field marks need be remembered, especially if comparisons are made with the accompanying diagrams of our gulls as they appear in the field.

HERRING GULL, *Larus argentatus.* This is the common large "Sea-Gull" of both the interior and the coast. Everyone should make the thorough acquaintance of this species before attempting to recognize the others. It should be the basis of comparison. The adult is the only large gray-mantled gull that combines the characters of black wing tips and flesh-colored legs. The young bird in the first winter plumage is the common brown gull that one sees in such numbers. No other young gull is quite so uniformly dusky in color. The young bird in the second winter is whiter and is often confused with the young ring-billed gull, partly because it has a semblance of a ring on the bill. The flesh-colored legs of the herring gull will help to identify it.

RING-BILLED GULL, *Larus delawarensis.* Considerably smaller than the herring gull, which it resembles closely, is the ring-billed gull with distinguishing yellowish legs, whereas those of the herring gull are flesh-colored. The black ring on the bill of the adult is also diagnostic. The brownish immature bird is often confused with the second year herring gull, but the color of the legs will distinguish them as will also the difference in the pattern of the tail which in both species is white with a dark band near the tip. In the young ring-bill, this band is quite narrow and sharply defined, while in the herring the dark color is broad, and blends into the white of the rest of the tail. The ring-billed gull's flight is lighter than that of its larger counterpart—indeed it might be said of the gulls as a group, that the lightness of their flight is in the ratio to the size of the bird.

IVORY GULL, *Pagophila alba.* This arctic species is of rare occurrence in the United States. It is the only entirely white gull with black legs. It differs from the other two so-called white-winged gulls (gulls without dark wing tips), the Iceland and the glaucous, in being much smaller than either with black instead of flesh-colored legs.

KITTIWAKE, *Rissa tridactyla.* The kittiwake is best known as an "off-shore" gull of the ocean, much smaller than the herring or ring-billed gulls, which it resembles closely in coloration. The legs of the kittiwake are black whereas those of the herring and ring-billed gulls are flesh-colored and yellowish respectively. Another diagnostic feature is the appearance of the black wing tips, which are cut straight across, perpendicular

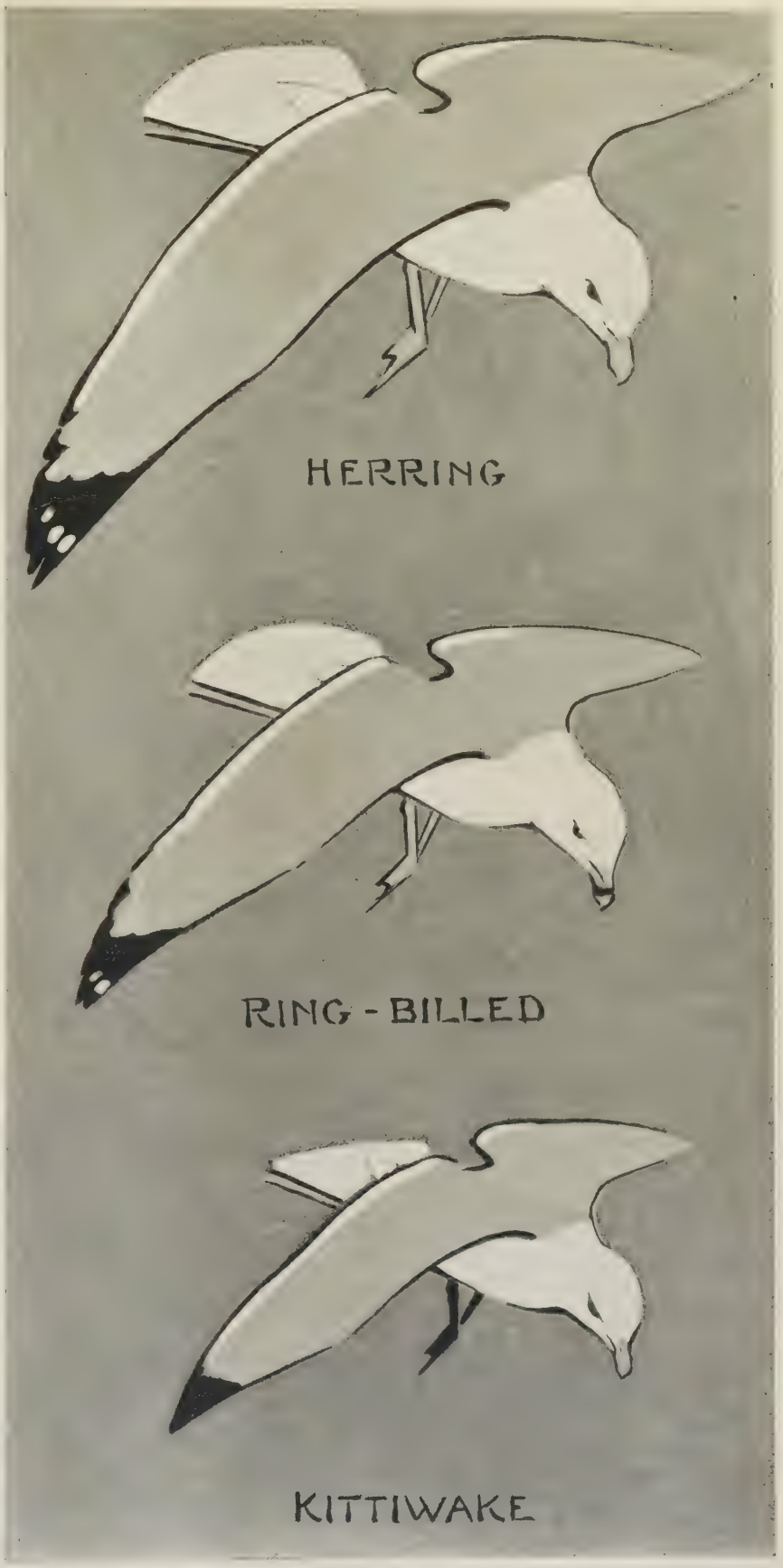
to the axis of the wing, as if they had been dipped in ink. The immature bird has a dark bar on the back of the neck and a black band on the end of the tail; it is most often confused with the Bonaparte's gull in the same plumage, but has more black in the outer primaries and along the foreborder of the wing.

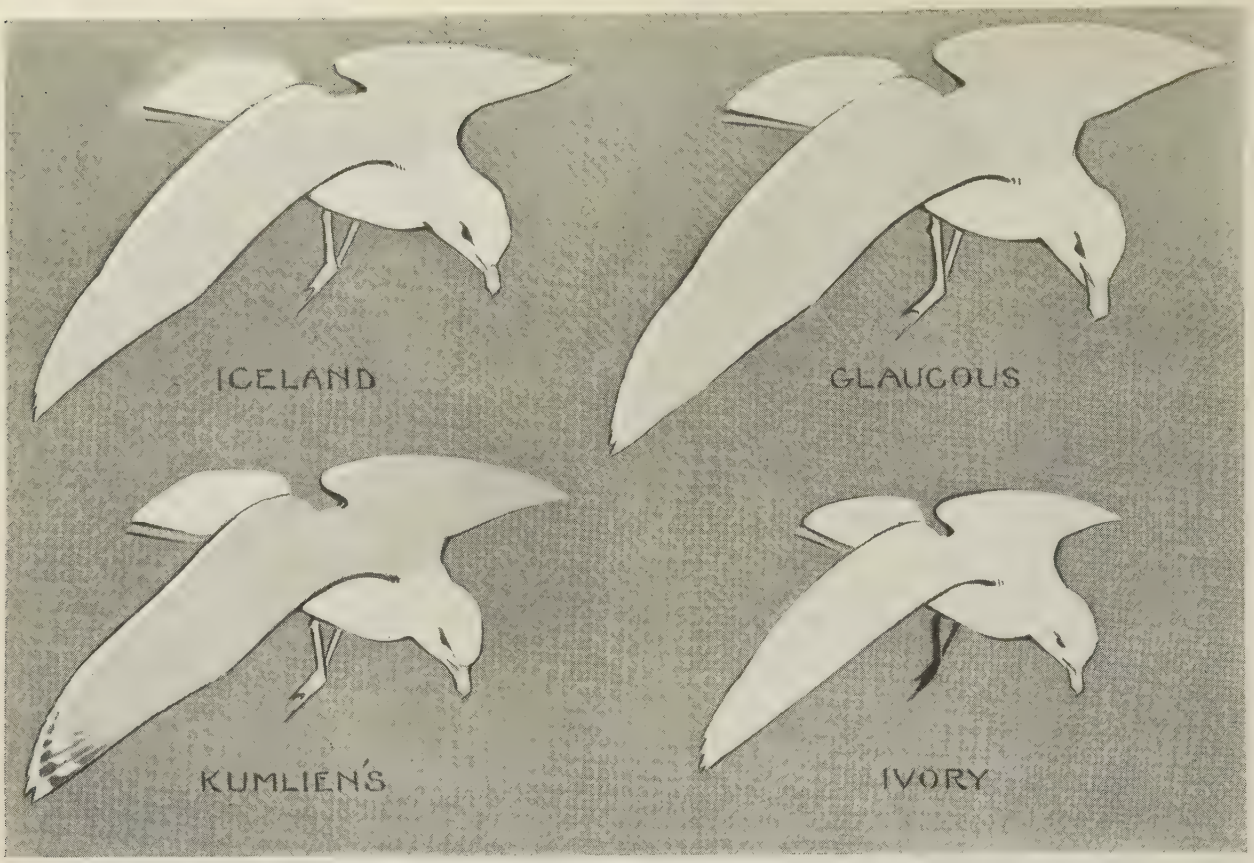
GLAUCOUS GULL, *Larus hyperboreus.* This is a large, pearly white gull without dark wing-tips; larger than the herring gull, or about the size of a black-back. Immature birds in the first winter plumage appear to be cream-colored, or buffy, but are recognizable as "white-wing" gulls by the lack of dark wing tips. This species and the next are often confused because of their similarity of coloration. Aside from the difference in size, the best field character is the bill, which in the glaucous is much longer and heavier. The rule of flight in relation to size is well shown in these two birds. The flight of the Iceland gull is a bit lighter and more airy than that of the herring, while that of the glaucous is noticeably slower and heavier.

ICELAND GULL, *Larus leucopterus.* Like the glaucous gull, this bird is pearly white without any dark markings, but differs from that species in size. The Iceland is usually a shade smaller than the herring gull while the glaucous is usually much larger. The character of the bill, cited above, will, after one has practice, serve to separate them. Adults of both species have pale gray mantles and wings, but at any distance the birds look almost pure white.

KUMLIEN'S GULL, *Larus kumlieni.* Our only gull with gray wing-tips. Similar to the herring gull in size and appearance, but with dark gray markings toward the tips of the wings instead of black as in that species considered a hybrid between Iceland and herring.

LAUGHING GULL, *Larus atricilla.* This bird is much smaller than the herring gull, and is the common black-headed gull found along our Eastern coast during the summer months. The adult may be distinguished in any plumage from the other small gulls by its rather dark mantle and wings. A conspicuous white border lines the inner edge of the wings. In the breeding season the bird has a black head. In winter the head is white with dark





markings. The immature laughing gull is dusky gray with a white tail terminated by a black band. It is the only small gull with dark underparts.

FRANKLIN'S GULL, *Larus pipixcan.* The Franklin's gull, a bird of the prairies, is purely accidental in the East, and its close resemblance to the laughing gull makes sight identification a highly risky procedure. The Franklin's gull has some sharply defined black markings towards the tips of the wings, whereas the black in the outer primaries of the laughing gull blends more evenly into the gray of the rest of the wing.

BONAPARTE'S GULL, *Larus philadelphia.* This bird is scarcely half the size of the herring gull. In the breeding plumage this species has a black head. Winter birds and immature birds have a white head with a conspicuous black spot behind the eye. Immature birds, like a number of other gulls, have a black band on the tip of the tail. The little Bonaparte's gull may be identified at a great distance in any plumage by the characteristic wing pattern created by the white outer primaries which contrasts strikingly with the gray of the rest of the wing.

LITTLE GULL, *Larus minutus.* This gull is a European species that has been detected a few times on our side of the Atlantic. The little gull shows some resemblance to the Bonaparte's gull and seems to prefer the company of that species while with us. It averages about two inches shorter than the Bonaparte's, from which it may be distinguished by the absence of black marks on the wing. The best field character is the blackish or sooty under-surface of the wings.

SABINE'S GULL, *Xema sabini.* This bird is about the size of the Bonaparte's gull. The only gull with a forked tail. The dark outer primaries and the conspicuous triangular white patch on the hind edge of the wings create a distinctive wing pattern that renders this very rare little gull unmistakable. The black bill is orange-tipped.

GREAT BLACK-BACKED GULL, *Larus marinus.* Much larger than the herring gull, this powerful gull may be recognized almost at the limit of vision. Even when so distant that the form of the bird becomes indistinct, it may be recognized by the dark back, which stands out as a black spot superimposed on the white of its underparts. Young birds are brownish and resemble the corresponding stages of the herring gull, but are paler, especially on the head and underparts. The head and bill of the black-back are noticeably larger.

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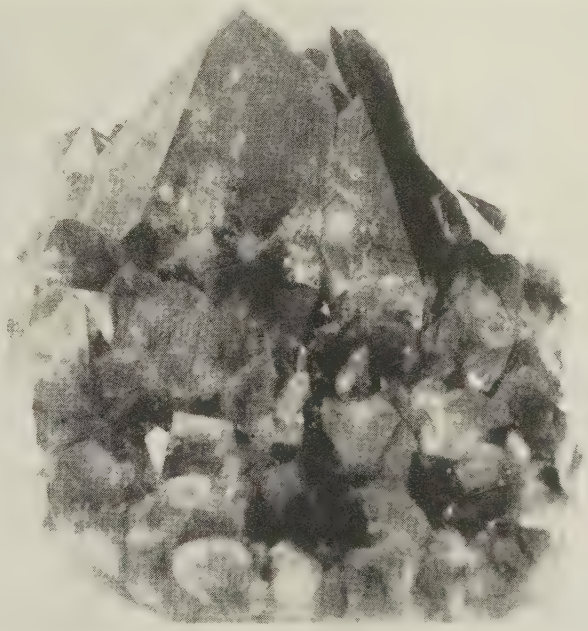
Now that winter is with us with all its bluster we cannot help but think of warmer climes of perpetual summer. To such a land the small group that makes up the membership of The American Nature Association West Indies Cruise will sail in February. If you feel the urge, drop a line to the Director of Field Trips, Nature Magazine, Washington, D. C., and hear about it.

THE AMETHYST STANDS FOR FEBRUARY

IT COULD ONCE PERFORM MIRACLES

BY AUGUST POHNDORF, JR.



AMETHYST IN ITS NATURAL SETTING

Part of a geode, revealing the amethyst crystals which later are cut and polished

The second of the series of articles on the birthstones by Mr. Pohndorf, Jr., gem expert. This month he writes of the famous amethyst, the earliest records of which go back to the Bible.

THE GREEKS, and later, the Romans, believed that he who wore the amethyst, the birthstone for February, clothed himself in immunity to the effects of "looking too long on the wine when it is red," and named the stone *amethistos,* which means, literally, "unable to become intoxicated." The maze of legend and tradition surrounding this gem of royal purple penetrates deeper into the roots of civilization, however, for one of the earliest records appears in the Bible, at 28 Exodus 15-30, in which it is described how God commanded Moses to place twelve enumerated stones in the breast-plate of the Jewish high priest, to represent the Twelve Tribes of Israel. The amethyst, the ninth gem, stood for the great tribe of Dan.

In the early Arabian mythology, this birthstone was supposed to protect one from gout and bad dreams; and in mediaeval times, when quack "alchemists" and charlatans were foisting a fetishism of gems upon the superstitious, and preparing elixirs from cracked or bruised stones as medicines for the soul and body, Europeans ascribed to it the psychic power of dispelling sleep and sharpening the wits, protecting its wearers from sorcery and giving victory to soldiers in battle.

In nearly all ages, the stone was emblematic of sincerity and contentment, and many are the tributes paid to it for this by bard and minstrel, philosopher and king.

The popularity of the amethyst has come down to the present without diminishing, but today it is not for its magical properties but because of its great beauty and low cost that both the Colonel's Lady and Judy O'Grady adorn their persons with its violet beauty. It is truly a plebeian stone gowned in royal purple.

The gem is not particularly brilliant, and its attractiveness lies in its velvet tone and the play of twin bluish- and reddish-purple colors that flash forth when it is moved quickly. Its shades vary from deep purple to a bluish- and reddish-violet, depending upon the way it is cut. The stones occur in six-sided prisms that are pointed on the top. The crystals are usually white or light colored at the base with a gradual deepening of the shade toward the apex. The finest gems are cut from the top, and of course command the highest prices. The remainder, in addition to its less attractive hue, may have a streaked or veiled appearance.

The chief source of the fine jewel used to be Russia, and the highest grades were given the name of Siberian

A FEW TYPES OF AMETHYST JEWELRY

This gem is suitable for all variety of settings. The square, which represents one square inch, indicates the comparative size of the pieces

amethyst. Now, however, Uruguay supplies beautiful stones which, however, may lack in daylight the hard appearance of the Siberian gems. Amethysts from Minas Geraes and Bahia in Brazil are ordinarily less deeply colored. Nice specimens have been discovered in the United States in Montana, Colorado, Virginia, North Carolina, Pennsylvania and Maine.

The basic chemical composition of the amethyst is the same as that of quartz and common sand—silicon dioxide; to this Nature has added small amounts of manganese, which supplies the shade. It is as hard as crystal, about seven on the lapidary's scale, and weighs between 2.6 and 2.7 times as much as water.

Many amethysts are found in hollow nodules or boulders in igneous rock, the cavities of which are lined with crystals. These nodules are called "geodes" by the geologists. The largest one ever discovered was found by a prospector some years ago on the high plateau of the Rio Grande du Sul in Brazil. It measured 39½ feet in length, 21½ feet in width, and nearly twelve feet in depth, and weighed more than thirty-five tons—so much, in fact, that the side walls could not support the top, which caved in. When found, it lay three and a half feet below the surface with the entire cavity filled with a reddish clay, in which was growing a palm sixteen feet tall. Fifteen tons of this geode were sold to a firm of German lapidaries, who used ten two-wheeled carts, drawn by eight oxen each, to transport it to Santa Cruz. The ultimate consumer probably paid about $300 a square yard for the inner surface area of this great find.

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HELPING BIRDS TO MIGRATE

BY JANE DOWS AMES

ALL ABOARD FOR THE SOUTH!
Loading thousands of swallows into a huge plane to transport them to Constanza on the Black Sea. This is probably the queerest migration in swallow history

MILLIONS of swallows flying down from the north toward Africa were caught in the wave of cold winter weather that swept over Austria last September. Overnight the green of the hills and valleys turned red and gold, and snow covered the mountains. The birds were buffeted by fierce wind and snow storms. They sought out shelter in houses and stables and hay lofts. The cold numbed their wings until they could no longer fly, and thousands lay in the frozen fields among the falling leaves.

There is no country in Europe where there is more poverty and hardship and suffering than there is in Austria, and yet the sorely tried people of this country had room in their hearts for compassion for the distress of the birds. From all parts of the country the Animal Protection League in Vienna received questions as to what to feed the swallows, how to save them. The Austrian Air Transport Company offered to take the exhausted birds to Venice where they could rest in a warmer climate before continuing their flight. Under the direction of the League, automobiles collected thousands that had been picked up in the city and its environs, and brought them to the airport. Truckloads came from nearby towns, and many were sent by train. The response was so great that the League had to charter several planes exclusively for the purpose of carrying the swallows south. One peasant walked ten miles with twenty birds his children had found and cared for themselves. He arrived breathless just as the plane was about to start, and handed his cage of huddled, quiet birds to the pilot through a window.

One airplane had a cargo of twenty-three thousand swallows. The birds were shipped in wooden boxes, each box containing a thousand. When they reached Venice they were released, and basking in the warm sunshine, were soon perky and gay again. Tourists in Venice this year could be photographed feeding swallows as well as pigeons in the square of St. Mark's!

When ornithologists learned that the birds were being sent to Venice they informed the League that it would be better to ship them to Constanza on the Black Sea, whence they could follow the land route over Asia Minor to Egypt. So the ensuing shipments went to Constanza, whence the birds continued merrily on their migration.

PUTTING SNAP IN THE GARDEN

BY ALBERT A. HANSEN AND E. R. HONEYWELL

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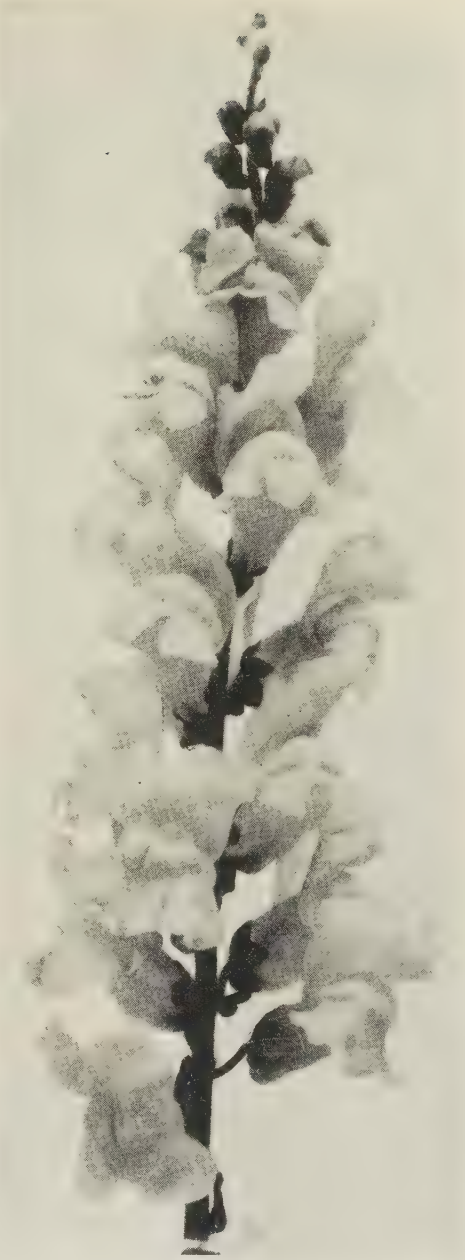


A NEW GIANT SNAPDRAGON
This strain is one of the finest in the recent development of this flower

TO ANYONE who has thrilled at the charm of a genuine old-fashioned garden, attempting to improve on the favorites of yore seems almost like "painting the lily". The skillful scientific touch of the modern plant breeder, however, has tampered with many of the garden gems of former years to the enrichment of the flower lover of today.

Among old-fashioned favorites that have yielded to the magic of up-to-date breeding methods is the antirrhinum or snapdragon. Whereas but a few short years ago the standard white, yellow and reds were the only kinds available aside from the unattractive spotted and striped monstrosities, today almost every shade imaginable has been fixed by plant breeders and come true to seed in shades that range from the purest white to canary yellow, golden, orange, rose pink, copper red, crimson and scarlet. More than that, a new race of giant flowered forms has been evolved with blossoms twice the size of the old-fashioned sort and with longer spikes, more profuse bloom, sturdier growth and greater resistance to disease and unfavorable conditions. The gorgeous array of brilliant color that has been fixed in this new race is an additional reason why the giants have attained unusual popularity in the few years since their creation.

Snapdragons are botanically called antirrhinum, from a Greek word meaning snout-flower, in allusion to the two-lipped blossoms. In the double forms occasionally offered by seedsmen much of the unique grace of the single flower is lost in a tangled mass of flower tissue. Most of our garden forms were evolved from *Antirrhinum majus,* a dwarf species native to the Mediterranean region. Although snapdragons have been admired and cultivated by man since ancient times, once in a while the plant escapes from modern gardens and reverts to a form resembling its wild progenitor. The plant was brought to America by the early settlers to add color to colonial gardens, but it was little improved until a decade or two ago when variations from the old-fashioned white, yellow and red kinds were introduced by seedsmen. The greatest improvement was the more recent development of the tall, giant-flowering strain.

Snapdragons are excellent for beds, borders or cut flowers, producing glorious banks of color from June until September when planted in solid beds. They blend charmingly with other annuals and perennials in mixed borders but require an open situation since they abhor shade. Some of the dwarf varieties frequently find foothold on walls and in stony places where they are sometimes seeded for this special purpose. Although snapdragons can be grown successfully in any good garden soil with the ordinary preparation given petunias and similar garden flowers, a light, somewhat sandy loam is preferred and will give best results.

Although snapdragons are perennials, they bloom the first year, making a somewhat ungraceful, woody and scraggly growth when brought through the winter for a second flowering season. For this reason the plant is best treated as an annual in common with most biennials and perennials that bloom the first season and should be freshly seeded every year. The seeds may be sown in the open as soon as danger of frost is past, when they will bloom in about ten weeks; or during August or September for bloom the following season. Fall-seeded plants bloom earlier but need a mulch of leaves to bring them safely

through the winter. Some of the fall-seeded plants may be potted and forced into bloom in the house where they lend a delightful touch of color when color is sorely needed. Early flowering can also be induced by sowing the seed indoors in a box of sand or under glass for transplanting later. Snapdragon varieties are divided into dwarf, medium and tall groups, ranging in height from six to thirty-six inches. When transplanted the tall varieties should be placed fifteen inches apart, the medium twelve inches and the dwarfs eight inches in order to give the plants room for the side development that means greater grace and beauty. The dwarf varieties are best used in the foreground of beds and borders while the taller varieties lend themselves best to the center of beds or in the background. The flowers should be cut freely for bouquets since this not only supplies marvelous spikes that retain their freshness and colorful charm for a long while, but also induces continuous flowering until the first frost. Snapdragons cut back severely during September can be potted for winter flowering indoors.

Although snapdragons are not among the finest of garden flowers in an olfactory sense, they do possess a unique fragrance that attracts hosts of bees. So efficient is the pollinating apparatus of the snapdragon blossom that it is practically impossible to keep seed true in the home garden and for this reason the product of the seedsman will be found most reliable. Where it is desirable to propagate a favorite variety, however, this can readily be done by pinching off shoots and planting them firmly in a box of sand where they soon take root and can be transplanted with ease. Even cuttings planted directly in the garden may root successfully and come true to variety. Shoots pinched off during August and planted in a sand box kept in a cool place make excellent plants for use the following season.

To one who knows only the stock red, yellow and white snapdragons of other days the colorful array of fine varieties now being offered is an almost startling revelation. Among the new giants Snowflake is almost pure, creamy white with a yellowish tinge to the lips. Another yellow-lipped variety is the magnificent Apple Blossom, a name descriptive of the pinkish color of the huge blossoms. For those who desire rose-pink there is the Fordhook Rose, with a blending of rose and yellow, or the Orchid with its beautiful pinkish-mauve flowers. Another descriptive name is borne by the Carmine Rose, one of the brightest of the giant strains. Fiery red are Defiance and Fire Flame, while the Ruby is distinguished not only by the ruby-red color but also by the delightful velvety texture of the blossoms. Lovers of yellow will find pleasure in Sunnybrook with its golden yellow and salmon shades, one of the finest of snapdragons, or in Sunshine, a brilliant yellow with a dab of pink in the tube. Brightest of the yellows is Canary Bird, a fine variety with sturdy stems and a profusion of bloom on long spikes, in contrast to Old Gold, where the yellow is subdued. In Maralda one gets a remarkably pleasing contrast of color in the gleaming yellow lip and the copper-carmine tubes. A similar contrast is found in Diamond where the tube is lilac and the lips carmine scarlet.

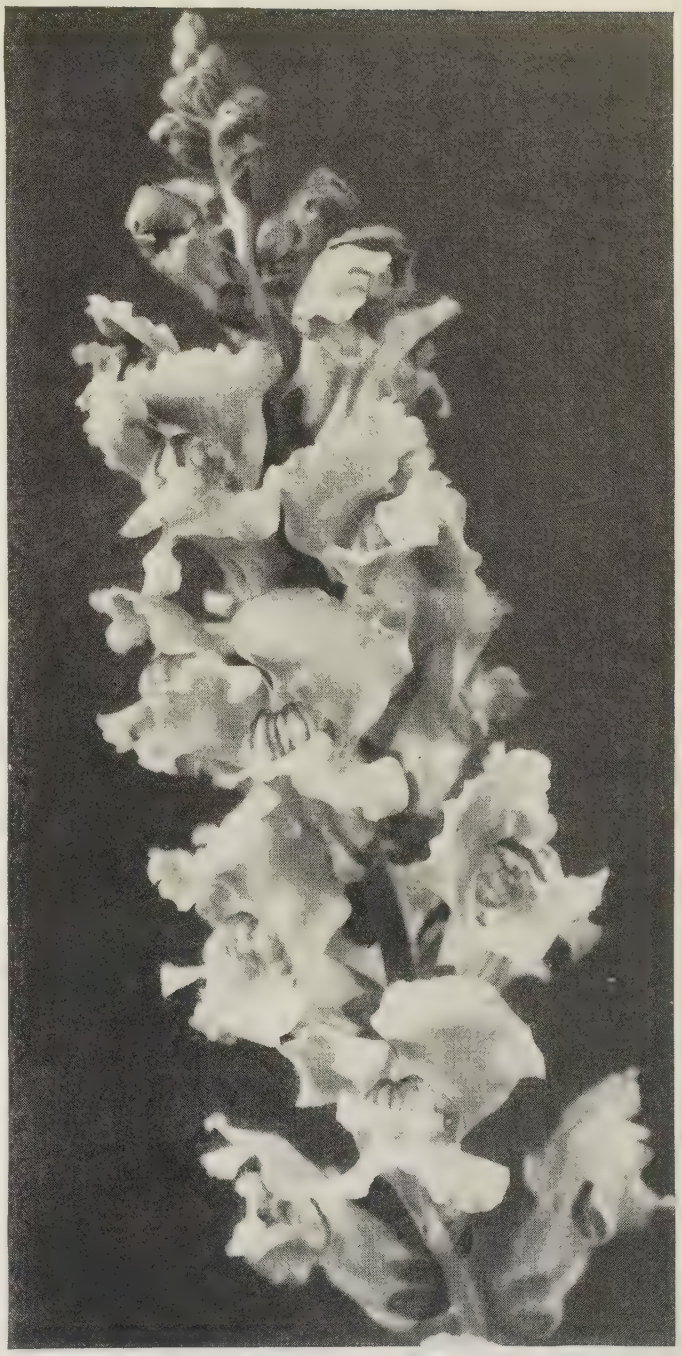
For those who care not for the giant strain, fearing they are too much of the greenhouse type for ordinary garden culture, the popular semi-dwarf group offers a sufficiently wide selection to satisfy the most exacting needs. The semi-dwarfs owe their popularity part-

RUST, ARCH ENEMY OF THE GARDEN SNAPDRAGON
Note the dark pustules on the leaves and stem in which are spores that spread the disease. Dusting with sulphur early and often is the only effective means of defense

ly to the fact that they require no staking and partly to the profusion of bloom, wealth of tints available and evenness of growth. From the great number of fine varieties offered it is difficult to select any that are particularly outstanding. Let the reader pick and choose from the dealers' description or from what seems to meet his needs in the catalog and have little fear of disappointment.

The dwarf varieties are still in demand as foreground plants, for small beds between walks and in similar situations. The dwarfs grow to an average height of about eight inches and may be had in a great variety of shades. They are usually designated by color such as Dwarf White, Dwarf Pink, Dwarf Red, etc.

Greatest bugaboo of snapdragon growers is rust, a fungus disease that spots the foliage and stems with unsightly rusty brown pustules loaded with spores that fly through the air, distributing the malady in all directions, particularly during wet weather. Rust attacks snapdragons at any stage of growth, causing malformation of tissues, interfering with flowering and eventually resulting in death. Dusting the young plants with sulphur is the best preventive treatment but make certain that dusting-sulphur and not the common flowers of sulphur is used. The earlier the work is done the better since sulphur dust may injure the flowering spikes. The number of dustings depends on the severity of the trouble and the effectiveness with which the dust is put on while the plants are young. Burning diseased plants, particularly old dead plants, and rotating snapdragons with other species in the beds will also be found helpful. Relief from rust, arch enemy of snapdragon culture, may be in sight in the development of a rust-resistant variety by Dr. E. C. Mains of the Purdue University Agricultural Experiment Station, although seeds of this new variety are not as yet commercially available. Dr. Mains is in charge of an experimental snapdragon garden in which a great deal of attention is being devoted to solving the rust problem.



SNOWFLAKE, A LOVELY SNAPDRAGON

This is one of the latest offerings and is a pure, creamy white. It is best to buy from seedsmen since it is hard to keep a pure strain in one's garden

Occasionally a blight known technically as *Phyllosticta antirrhini* attacks the foliage and stems or may cause damping off in the seedlings. The first indication of trouble is usually the development of yellowish spots on the leaves that gradually enlarge, while darkened, shrunken areas appear on the stems on which tiny black pimples may be observed if the sight is keen. For this disease spray with Bordeaux mixture.

Mites, tiny sucking insects, may also attack snapdragons, but they may be killed off by spraying with a nicotine solution. Nicotine insecticides may be purchased from dealers with full directions for use.

A species occasionally found in gardens is the so-called wild snapdragon, better known as butter-and-eggs or toadflax, which may readily be distinguished from garden snapdragons by the spurs on the blossoms. This is an undesirable in any garden due to its weedy tendencies and the difficulty of getting rid of it when the plant's usefulness comes to an end. The name Ramstead weed is sometimes applied to this species because, so the story goes, a man named Ramstead who dwelt in suburban Philadelphia introduced the plant into his garden and it soon escaped bounds to become a persistent weed throughout the vicinity.

Snapdragons are without question among the finest, most colorful of garden plants. Their easy culture and great beauty made snapdragons old-fashioned favorites; the remarkable new varieties should give them a similar place of honor and affection in the modern garden.

THE SHAD BUSH

A SPRING BLOOM

BY DR. E. M. GRESS

THE BEAUTIFUL SHAD BUSH
It recalls childhood days when it used to break the monotony of winter

AMONG the shrubs and trees, there is one that always recalls to me, when I see it, the days of my childhood. How I used to watch for its profusion of snow-white flowers after the bleak monotony of the winter months, and how beautiful it was as it overhung some stream that flowed peacefully along the base of a wooded hillside. It is the shad bush, which still continues to gladden hearts in April and May.

For many, however, the beauty of this shrub may be the beauty of utility, and they may love it best when, about two months later, it hangs gay with beautiful red or purple juneberries. Oh, what a delight to climb one of these slender trees to the topmost bough, then swinging outward, bend it over to the ground, where each and all may help themselves to the delicious, juicy fruit.

No one wonders why this shrub is called "juneberry," but some of the other common names by which it is locally known are not so obvious. Shad bush or shadblow is a name of long standing, no doubt having been given because it blooms at the time when the shad are ascending the streams to lay their eggs. Among the other common names are: service-berry, Indian cherry, sugar plum, and Indian pear.

The juneberries are so common that a detailed description is hardly necessary. The alternate leaves are very variable as to size and shape. They are from less than an inch to two or three inches long, and generally oblong or ovate, although sometimes nearly round; the point is usually rounded, the margin somewhat toothed, and the base rounded or heart-shaped. The flowers, which are ordinarily borne in clusters of five to ten, appear the latter part of April and first part of May. Each has a cup-shaped calyx with five lobes. The five white petals are about one-half an inch long and rather narrow, although they vary in size and shape, especially with the different species. There are many stamens. The fruit is a berry-like pome, which is a name given to some of the fruits of the Rose family, as, for instance, the apple. It is dark red or purple, from one-fourth to nearly one-half of an inch in diameter and very sweet and delicious when ripe.

JUNEBERRY FLOWERS
They have a cup-shaped calyx with five lobes, and petals one-half inch long

WHAT BOYS SEEK
The shad bush fruit is delicious. The leaves vary in size

ROLLING SNAKES

THEY MAKE QUEER PATTERNS ON THE SAND

BY DR. W. MOSAUER

SCREW-LIKE TRAVEL

Only two sections of the snake touch at the time, leaving parallel disconnected tracks

Most Americans are familiar with the fairy story of the hoop-snake, which was believed to be capable of rolling down hill and finally stopping by pushing its spiny tail into a tree. It is, however, little known that there are real snakes which apply the principle of rolling in their locomotion.

When I was travelling by camel over the sand dunes of the Sahara in 1928, I noticed one morning a track which was so peculiar that I dismounted and stooped down to investigate the mystery. There were ribbons drawn on the sand, narrow and approximately straight, with closely set cross stripes from one margin to the other. These ribbons looked like the track of a snake, which had lain stretched on the sand, its ventral scales leaving the transverse impressions. But no track led away from this spot; instead there was another track like it, exactly parallel to the first one, close by but absolutely disconnected. A third, a fourth, and a fifth track followed, all of them parallel and without apparent connection. I was amazed. How in the world could a snake leave tracks like these? It looked as if the creature, lying stretched on the sand, had leaped through the air from one track to the other!

The tracks were followed until they ended in a small strange sand pile. A pattern shaped somewhat like a "pretzel" indicated the position of the coils of the snake, which was hidden under the sand but for the head. Dug out, it proved to be a specimen of the small but very poisonous *Cerastes vipera,* a short, rather thick-bodied viper, yellow as the sand.

When it saw itself uncovered and apparently endangered, it turned to flight. Swiftly it threw out a large loop, bringing it up to the side of the head as in the photograph. Then it proceeded with surprising speed over the desert, but not in the typical serpentine wriggling. Sidewise it moved, like a crab on the seashore, with such a startling, uninterrupted looping of its body that the observer felt slightly dizzy.

It was not until a careful study had been made that the mystery of this locomotion was solved.

When the snake moves, only two sections of its body are in contact with the ground. These alone leave impressions on it. The intervening portions of the body are lifted off the sand. Now the points of contact are migrating tailwards, and new parts of the body are always touching the ground.

The whole process can be compared best to the rolling of a screw or helix. Such a screw of about two turns will leave, when rolled sidewise, tracks exactly like those made by a "rolling snake".

That the movement of the snake is really a rolling appears from the fact that the single points of the snake's body do not slide over the sand, as is the case in the normal undulatory snake movement. In the "rolling snake" each point is set down on one point of the sand, touches it firmly for a moment, and is lifted off again. The same principle is to be found in the rolling of a wheel.

Naturally the snake's body does not loop over, as a rigid screw would. The flexible snake can take the short way in an almost horizontal plane between the two sections which touch the ground. Yet the absolute identity of the tracks left by a sidewinding or rolling snake and by a rolling screw is the best proof for the identity of its type of movement.

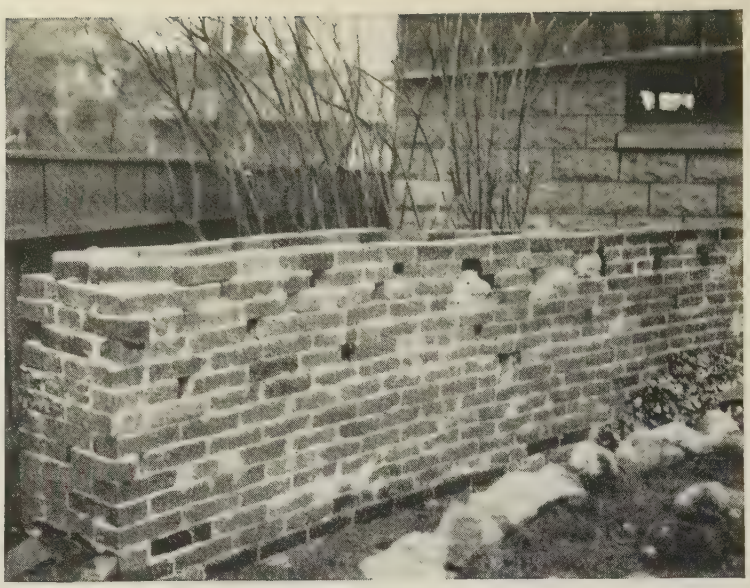
WHERE THE SNAKE WAS BURIED

The small strange sandpile marked the folds of the reptile as he tried to hide

TAKING A GARDEN TIP

BY ORPHEUS MOYER SCHANTZ

In the September, 1930, issue of Nature Magazine, Dr. Francis Heatherly of England wrote about Hollow Wall Gardening. His suggestions were so alluring to Mr. Schantz that he put them into effect in his own yard with engaging results



THE HOLLOW WALL BEFORE PLANTING
How Mr. Schantz adopted and adapted this novel suggestion for the garden

"THAT should be fun," I declared, after reading the story of the retired English doctor and his hollow wall garden. And so, having a corner of my yard for the experiment, I skirmished the neighborhood for left-over brick and proceeded to build the suggested garden chimney. Here is how it was done. A trench twelve inches deep, twelve feet long and eighteen inches wide was excavated. A base of well-tamped cinders was made to the depth of about ten inches. On this was built the structure shown in the illustrations. Completed, I had a hollow wall eleven and one half feet long, three feet high and with an opening at the top of ten inches. The wall was built slightly concave instead of perfectly straight.

AND HERE IT IS IN AUGUST
The hollow wall garden with planting in it and on it serving as a background for other flowers

Holes were left at intervals between the bricks as the plans called for, and for ornamentation a number of fine specimens of quartz rock were built in with the brick. The chimney was then filled with broken brick at the bottom, to insure good drainage. Last year's accumulated elm and maple leaves, sand, and an upper surface of good black soil were added. It was completed in late summer and no planting was attempted at the time. Fearing that it might be flooded with water and possibly wrecked by expansion from freezing, it was kept covered through the winter with building paper. As early as possible in the spring, the chimney was planted with small iris and a few other surplus plants, without much thought of bloom.

Not having any suitable vines to use for planting in the openings, I used several varieties of creeping sedums with great success. At the base of the chimney in richly fertilized soil, a half dozen strong roots of the ostrich fern were planted, with sedums and johnnie-jump-ups in between. About two and one half feet from the chimney a hastily constructed rock garden was made, in which were planted sedums, pansies, forget-me-nots, irises and whatever else was at hand that would make a rapidly growing cover. Later petunias were planted at the back of the rock garden, and a number of volunteer plants appeared and prospered.

The experiment was a success from the beginning and even during the hot days of July and August everything grew luxuriantly. The only watering was done at the top, so that the soil was never allowed to dry out.

The effect of the brick chimney with the ferns against it, sedums draped down over the front, and the rich green of the iris and gladiolus filling the top, was quite stunning. The possibilities for next year are intriguing, and already plans are being made for a succession of bright blooms to make a display throughout the summer. This can be done with irises, glads, petunias, or whatever may please the owner. It would also be possible to have tall cosmos behind the chimney for late summer

background. The pictures show the method of construction and material used, which in this instance was a rough-surfaced vitrified brick. The several stages of the development as the summer advanced were fascinating. Common brick is best but any rough brick will answer.

The chimney garden fully accomplished all that was claimed for it, and I recommend it with much enthusiasm as a novel, simple and inexpensive garden annex.

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HONOLULU AQUARIUM

BY STEPHEN HAWEIS

OF ALL aquariums, that of Honolulu is easily the most diverting because so many of the Hawaiian fishes are as brilliant as opals or butterfly wings and so beautiful that even the hungry forget that most of them are edible.

This aquarium is populated with creatures which more or less literally have jumped out of the frying pan into the tank. Most of them were destined to thrill the epicures; but when the Japanese fishermen learned that any unusually beautiful or peculiar fish would command a higher price from Mr. Potter at the Aquarium than from some cook at the market-place, the rarest denizens of the deep generally came his way. Which was lucky for the fish, as their bright colors generally cover delectable flesh, and some of the gayest are also the most delicious. Now they live far longer in the glass tanks than they would have lived in the sea, have regular meals and enjoy a continual movie of visitors, which is provided for their entertainment from nine to four every day. They are even protected from the imbecile remarks which are made about them by a solid inch wall of plate glass.

ENTRANCE TO THE AQUARIUM
Movies in the form of passing visitors entertain the fish from nine to four each day

The tanks are labelled with a description of each fish with its Hawaiian and scientific names, but very few people read them. When they do, they are often no better off. It does not help much to learn that a dainty and purple miracle with a slender proboscis resembling a straw is called *Forcipiger longirostris,* and its pet name of "Lawiliwili nukunukuoeoe" is not much better. The bright stranger just says, "Oh look at the fish with the long nose," and passes on.

The balloon fish, the unicorn, the surgeon fishes of many varieties and all sorts of things painted with scarlet and gold, violet, orange and blues and greens in endless combinations of spots and stripes provide matter for equally brilliant sallies. Among the more beautiful specimens often commented on is the uhu, a parrot fish like an exquisite Persian turquoise, which was once a royal fish, far too good to be eaten by common folk. It was eaten raw, in pickle, by the king alone; but when people began to cook fish, the uhu lost its favor in court and is now considered one of the poorest of all, because its flesh is so soft. Fickle is fish fortune!

The bright colors of the aquarium fish show that they are not unhappy, for sick fish fade rapidly. It is quite likely that they are just as much diverted by us as we are by them. The octopus must enjoy climbing up and down the transparent rock upon which his suckers can obtain such a marvellous hold, and what can a moray hope for in life more than a comfortable drain pipe in which to sleep with enough food obtained without effort and competition? Animals, like simple people, live in the moment and do not grieve about what they have not got so long as their needs are attended to. Occasionally a visitor will grieve over the death of a Moorish idol or other dainty exhibit, but he does not reflect that all these fishes were saved from the frying pan in the first place, and that nobody lives forever.

On the whole the people deeply appreciate the Aquarium, realizing that only through its means are they able to look into the "world beneath the brine" and learn that there is a beauty touched with strangeness which they never knew before. Everybody learns something new, if only that "fish-shaped" is an expression which means very little. Henceforward they will know that a fish may be of any shape, round or square, flat or thick, short and fat as a potato or as long and thin as a bit of string. It may be scaled or armour plated, or have a skin smooth as slime or rough as sandpaper. Deep sea fishes are sometimes black as night, carrying their own headlights, while others are as transparent as glass. Some seem to have hair, feathers or spikes; legs to walk or wings to fly! The most vivid imagination seems tarnished in the presence of the denizens of the sea at the Honolulu Aquarium.

THE CRY OF MYSTERY

BY ARTHUR SHORE

THE EVENING air is chill in the higher altitudes of the Cascades, even in midsummer, and the dozen or more men lounging about the fire had their stag shirts buttoned closely around them. The conversation had become desultory, and then ceased entirely.

They had come in to fight a forest fire that raged just over the summit, and glowed crimson now against the skyline. Clayton, the chief, lay back smoking, his head propped against a bed roll. He rose to knock the ashes from his pipe, and held it rigid, poised.

IT WAS A MOTHER GRIZZLY HE SAW

And the baby bears were busily nursing when Clayton came upon them

From below had come a strange cry, an eerie wail of distress. A weird and plaintive cry that carried far, and with a strange insistence proclaimed the solitudes as its origin. These men of the mountains waited tense and expectant, but the cry was not repeated.

Presently a big, blond Scandinavian blurted out, "Vat you t'ink dat bane?"

Clayton answered him, naming a mythical monstrosity of the wilds, and in the laugh that followed the incident was dropped. Before rolling in, Clayton went down to the spring for a drink and Frenchy Du Bois followed him. As Clayton handed him the cup, Frenchy ejaculated, "By Gar, Clayt, I nevair hear him befo'. She's mak fonny cry!"

"You got me, Frenchy!" Clayton answered. "I've put in some time in these hills, and I never heard that cry before—and yet it seems vaguely familiar. It seems I ought to know. I can't quite make it out."

The fire presented no unusual difficulties and two days later was under control. The third day Clayton worked afield to pick up any spot fires that might have been set by sparks blown over by the wind.

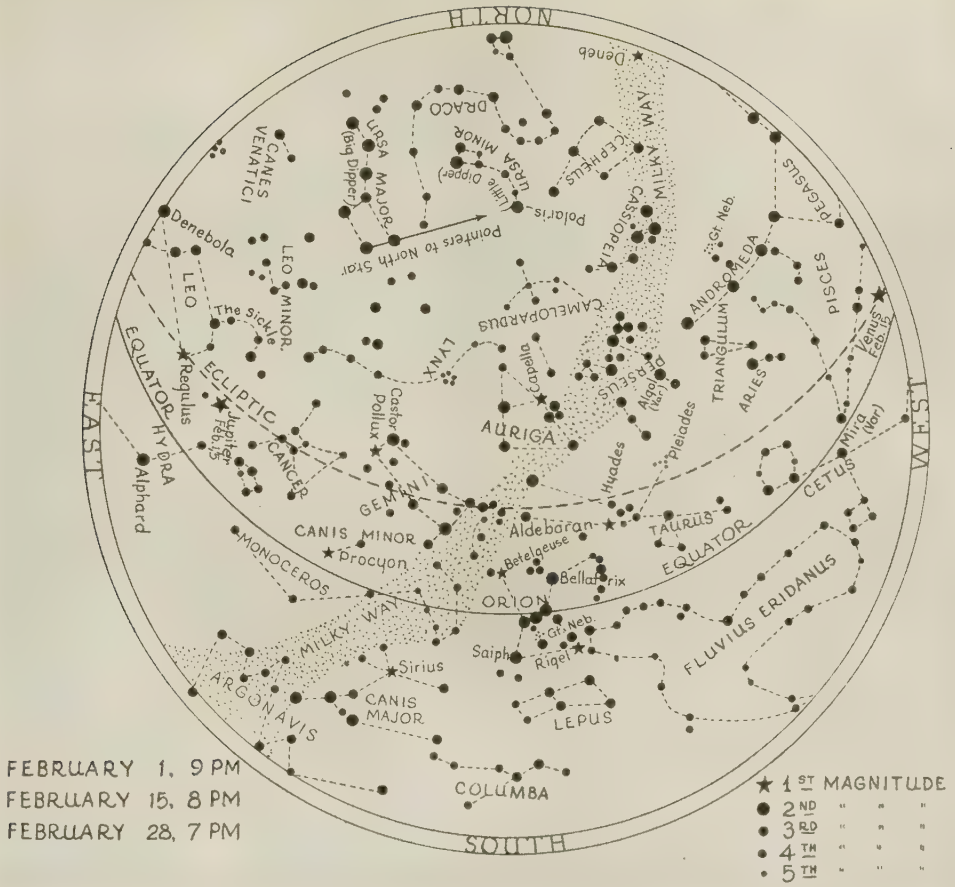
As evening approached he found himself well below camp, and taking an old, dim trail he struck off up the slope. After a rather steep stretch the trail continued up on a more moderate incline, following the base of a densely-timbered ridge on the right hand, and skirting the margin of a low, marshy meadow several acres in extent on the left. He had covered approximately two-thirds of the distance up the meadow when he discovered a patch of salmon berries along the trail. He was well aware of the flat flavor of these, but their color intrigued him, shading from yellow to orange, and some with a deeper shade of red. He gathered a few, and then stood fascinated and strangely elated.

The cry had come again, clear and distinct, and easily located out across the meadow in a clump of alders. This time it was repeated. Clayton, his curiosity thoroughly aroused, moved out across the meadow. The soft, spongy soil carried no sound. There were no twigs to break, and he moved rapidly.

Arriving at the alders, he could see an opening in the center. He was quite close to the quarry now, and could hear indistinguishable sounds, and then a weird and muted whimper. Again he felt the elusive sense of something familiar. A breeze was blowing gently across the alders toward him. He found a natural opening down a water course and eased down it.

A large branch hung low across the path and Clayton swung it aside. Not more than twenty or thirty feet separated him from the sounds, and he glanced down. In the mud was the track of an enormous grizzly, and beside it the tracks of two cubs. He knew now. And the cubs were nursing. Gently he swung the branch back, and silently slipped away. Thus was a mountain tragedy narrowly averted.

I had occasion to go into this country last season. I could find no sign of the old grizzly, nor did inquiry among the sheepmen disclose anything. But this is a vast country of jagged peaks, and slopes of brush and timber, of alpine glades and meadows. A grizzly ranges widely, and it is quite probable that from the headwaters of the Skykomish and northward this old girl still ranges through the brief summers, and lies hibernated through the deep snows of winter, imbued with that endeavor, old as life itself, to survive and perpetuate—in this instance, the last of a magnificent species.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

THE STORY OF THE CONSTELLATIONS

BY ISABEL M. LEWIS

MANY lands have laid claim to the honor of originating the ancient forty-eight constellations among the eighty-eight or more that are known today. Chief among these are India, Mesopotamia, Egypt and Greece. Although the Greeks probably did not originate the more ancient of the present sky-figures they have at least given to us most of our knowledge of these early groups and to some extent changed and added to them.

Ursa Minor, the constellation of the Little Bear, was not mentioned by Homer or Hesiod. It was about 600 B. C. when Thales, who knew of its use in Phœnicia, urged the Greeks to use it as a guide in navigation instead of the well-known Ursa Major.

Among the constellations of the zodiac, Scorpio was originally a double sign and all of the groups represented animals. The zodiac in this form, or as six alternate signs, namely, Taurus, Cancer, Virgo, Scorpio, Capricornus and Pisces, originated in Mesopotamia, it is now generally believed, and was later divided to correspond to the division of the year into months. The claws of the Scorpion, or Chelae, represented the group that was renamed Libra, the Scales, in the first century B. C.

It is known that the Chinese mapped the heavens in the form of constellations as early as 2500 B. C., but the groups adopted by them differ widely from those chosen by the Euphratean and Egyptian astronomers. A remarkable way of dating approximately the first sky maps that were made in Egypt or Mesopotamia has been worked out. When Alpha Draconis is the northern pole star and is in certain positions, constellations in the region surrounding the south pole of the heavens are invisible in the latitudes about 30° North—the latitudes of Egypt and Mesopotamia. Now the first maps showed gaps where these southern constellations should be, indicating that they were invisible at the time, and placed Alpha Draconis as the northern pole star. A study of the known rate of the Precession of the Equinoxes, which causes the change in the position of the pole star, reveals the fact that the conditions shown on the maps ob-

tained about 2400 B. C.

Among the Greeks, who have given us most of our knowledge of the early constellations, was Eudoxus, a prose writer living about 370 B. C. He described in one work the system of constellations known to Homer, who, in turn, had probably gotten his knowledge from the Mesopotamian system of 1600 years before. A century after Eudoxus, the Greek poet Aratus wrote his famous *Phenomena,* descriptive of the same constellations. This poem of Aratus has been a valuable guide and our chief source of knowledge of the form of the forty-eight ancient constellations. It was introduced to Rome by Cicero, and the Roman ladies as a result of it often embroidered the celestial figures in gold and silver on costly tapestries.

It was Hipparchus, however, who made the first catalog of stars. He completed it about 127 B. C. It contained 1080 stars in the form of forty-eight constellations. His was not an original system, for he used the same plan that had been handed down by tradition for more than two thousand years.

The catalog of Hipparchus has become lost except as it is preserved by Ptolemy, who, in the year A. D. 137 at Alexandria, made a catalog of 1028 stars arranged in the same constellations. There were twelve groups in the zodiac, twenty-one in the northern skies and fifteen in the southern region of the heavens.

Ptolemy, strange to say, did not try to add to the ancient system, although there were regions of stars visible to him at that time that were not visible to Hipparchus. Enslaved by a tradition handed down for more than two thousand years he observed and cataloged only stars of the original groups, and the only real contribution he made was to give us a basis of estimate as to when the system he utilized was first formed.

From Ptolemy's day no advance was made in the science of astronomy for thirteen centuries, except for the compilation of the Alphonsine Tables by Arabian or Moorish astronomers. These men were under the patronage of the Infante, who later became King Alfonso X and of whom it was said that he "abandoned the crown for the astrolabe and forgot the earth for the sky." These tables were copied in the main from Ptolemy's with necessary corrections.

After the discovery of the New World, star groups of the southern hemisphere in the vicinity of the south pole became more widely known and gradually appeared on new star catalogs. Bayer, who introduced in his *Uranometria* the practice of using Greek and Roman letters to designate individual stars, mapped twelve new southern groups. His work was published in 1603, the year after the appearance of Tycho Brahe's famous catalog of 777 stars placed in forty-six constellations.

The Abbé Nicolas Louis de La Caille has been called "the true Columbus of the Southern Sky," because he introduced fourteen new groups and gave to them the names of the principal instruments of science and the fine arts. Other noted compilers of star catalogs were Bode and Flamsteed and La Lande. Their arrangement of new groups and the boundaries of constellations are no longer recognized, however.

By the early part of the nineteenth century the man-made constellations were in a sad state. Every astronomer who had compiled a star catalog had adopted his own system of nomenclature, added new asterisms, or had changed the boundaries of those already established by earlier compilers. The boundaries of the ancient forty-eight constellations were uncertain or in dispute. There was, in addition, a hodgepodge of geometrical figures, scientific instruments and weird forms in existence in the southern hemisphere where there had been gaps in the ancient star maps. At each appearance of a new star catalog confusion became worse confounded. To quote Miss Agnes Clerke, that delightful British writer on astronomy, "it has come to pass that a star has often as many aliases as an accomplished swindler."

In 1841, the Royal Astronomical Society of England gave to Sir John Herschel and Sir Francis Baily the task of attempting to straighten out this confusion, to do a little celestial housecleaning, as it were. The changes they made were too sweeping, however, and were not universally adopted, so the constellations remained as they are today. It may be hoped that the committee of the International Astronomical Union, which is now engaged with this same problem, will be more successful.

There are today between eighty and ninety constellations that are generally recognized. The subdivision of certain large constellations into two or more, as, for example, the huge constellation of Argo Navis into Vela, Malus and Puppis, accounts largely for this difference in number. Every star today belongs to some constellation, but the trouble is that it sometimes belongs to two, a state that leads to confusion. To give an example, a star placed in Scorpio and assigned a letter or number by a compiler of one star catalog is included in the neighboring constellation of Libra by another uranographer who does not recognize the same boundaries as his colleague.

The custom of designating stars by the letters of the Greek alphabet in the order of their brightness is a very useful one and will probably never be discarded. For example, Sirius is named Alpha Canis Majoris,—that is, the Alpha of the constellation Canis Major. Beta Canis Majoris is the star next to Alpha in brightness and Gamma is the third in brightness. Spica is Alpha Virginis; Regulus, Alpha Leonis, and Antares, Alpha Scorpii. The fact that in the constellation of Gemini the brightest star, Pollux, is called Beta Geminorum while Castor, second to Pollux in brightness, is known as Alpha Geminorum has led astronomers to believe that there may have been a change in the relative brightness of these stars since they were first given these designations.

A custom introduced in modern times that is useful is to designate a new or temporary star, or an irregularly variable star, by the letters R, S or T. For example, T Coronae Borealis is the name of the Nova that appeared in Corona Borealis in 1866.

It has been a much debated question whether the constellations were originally named for certain forms be-

cause of their resemblance to them and the myths or legends concerning them invented later, or whether the legends were already known and the sky-forms designed to illustrate them. The latter theory is more probable than the former. Certainly the resemblance of the constellation to the object for which it is named is usually slight. It would take a great stretch of imagination to see in Auriga the form of a charioteer holding a she-goat and her two kids in one arm or to see in Perseus the form of a hero, or in Andromeda that of a maiden. On the other hand, with the exercise of much less imagination, we may see in Orion the form of a huge warrior striding across the heavens with uplifted arm or in Hercules the form of a man with his foot resting upon the head of a dragon whose tail lies between the two Bears.

Draco and Hercules are believed to be two of the most ancient constellations. Thuban, or Alpha Draconis, was the pole star at the time of the building of the great pyramid. This gigantic building has an inclined passage that points directly toward this star when it is within 3 degrees 42 minutes of the pole. It is known that Thuban was in this position in 3400 B. C. and 2160 B. C. The great pyramid could not have been built at the later date, it is believed, so the earlier date must mark its construction. The first permanent record of Hercules appears in a work by Aratus, who wrote of the constellations as they appeared, not in his time, but more than two thousand years earlier. He describes the constellation as "a laboring man in a kneeling attitude with his right foot on the scaly Dragon's crest."

The existence of three connected groups of constellations in the heavens would seem to indicate that in general the sky-forms were devised to illustrate some legend or story previously known. The story of the Deluge is illustrated by the constellation of Argo, which represents the Ark and its associated groups. The Raven sent out from it is Corvus, which is on the back of Hydra. The Centaur, builder of the Ark, and represented as half man, half horse, carries a beast in his right hand which is now designated as Lupus, the Wolf. The creature is intended as a sacrifice on the altar, Ara, which is close by. The clouds of smoke which arise from it are represented by the Milky Way, which passes through Ara, Centaurus and Lupus. Not far away is the Watery Region of the heavens. Here are to be found Capricornus, the Sea-goat, which has the head and body of a goat ending in a fish's tail; Aquarius, the Water-bearer, pouring a stream of water from his urn, and Pisces, the Fishes, as well as Piscis Australis, the Southern Fish; the Sky-River, Eridanus; Cetus, the Whale; Hydra, the Watersnake, and Delphinus, the Dolphin. Aquarius is one of the most ancient constellations and in Euphratean astronomy the region in which it lies was known as the Sea and was supposed to be under the control of Aquarius.

In the Royal Group, which forms another connected system of constellations, are Cepheus and his queen Cassiopeia, and Andromeda, their daughter, who is chained to the rocks to be devoured by Cetus, the Whale. Perseus is pictured coming to the rescue on his flying steed Pegasus. The bright star clouds of the Milky Way in Perseus represent the cloud of dust raised by Pegasus.

We see in the heavens this month both the Royal group and the Orion group. In the far north is the ancient constellation of Draco, the Dragon. Hercules is at this time below the northeastern horizon.

High in the eastern sky is Gemini, in which, without greatly overtaxing our imagination, we may see the forms of the twins, Castor and Pollux.

Venus is now a beautiful evening star in the west. Jupiter is in opposition on February 7 and visible all night in Leo. Mars comes into conjunction with the sun February 1 and is invisible all the month. Saturn is in Capricornus and visible in the southeast before sunrise. Mercury is not well placed for observation this month.

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THE HEAD OF A DUCK—SO IT SEEMS

But this queer concretion has no more relation to a duck than the trans-Neptunian planet has to Illinois politics. It is a pseudo-fossil, belonging only to the mineral kingdom

THINGS TO THINK ABOUT

Official Vandalism

"Special attention is called to the groups of oaks, magnolias, and elms, all of which are indicated on the map. The entrance avenue of 90 fifty-year-old ginkgo trees constitutes one of the unusual features of the grounds, and one of the most striking examples of this species in the United States."

This is a paragraph quoted from a small pamphlet issued by the United States Department of Agriculture in 1923, the purpose of which is to assist visitors to find important and interesting features in and about the department that, to the great majority of our citizens, carries the strongest appeal and the keenest sense of personal ownership of any in Washington, excepting possibly the Smithsonian Institution.

But within the past few weeks countless visitors and residents have been shocked beyond expression to see that double row of beautiful ginkgos fall before the axe and mattock, as if they were mere weeds, while close about them, and fast threatening their still living companions, the hurrying trucks pile high the earth from city excavations. "What are they doing, and why?" sums up the hundreds of questions that come from bewildered lovers of trees and natural beauty.

The City Planning Commission, a body that consists in part of members of the Fine Arts Commission, is said to be responsible for the destruction, now well nigh complete, of a plantation that for scientific interest and sheer beauty is scarcely surpassed anywhere in Washington. In a few weeks the loving work of some of our greatest landscape gardeners, spread over nearly a hundred years, has been laid waste. A few trees were moved in the spring, but most of these are already dead or dying. The planning of a straight and level street and vista, running from the Capitol to the Washington Monument, is one of the objects to be gained by all this devastation. Besides the ginkgo, one of the oldest of our trees (for it flourished widely in North America in remote geological ages) there are stately oaks and elms, pines and beeches, and scores of others from our own country and from Europe, and magnolias from Japan. This is to name only a few. The saddest part of it all is not the loss of these trees, but the realization that in the capital city of our land any group has the power so to despoil the grounds of the very department that preaches tree-planting and tree-care. We have no knowledge as to the official attitude of the Fine Arts Commission toward living and growing trees, but we can think of many places in Washington where its efforts might be better applied than in this act of official vandalism. How shall our people evaluate appeals to promote love for trees with this appalling example of waste before them?

We grieve for the loss of this beauty spot, but more than this we pity the attitude of mind that seeks to justify such needless desecration as is now going on. And in our sorrow and bewilderment we wonder if the trees in the Smithsonian grounds, and even the Institution building itself, may not be selected for the next sacrifice.

A PAGE DEVOTED TO CONSERVATION FROM VARYING ANGLES

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The Latest from the Duck-hogs

When the Federal Government reduced the waterfowl season to one month, after studies that proved that the stock had become dangerously reduced, the better class of sportsmen accepted the action as a wise precaution.

But among those who hunt ducks for sport or profit there are many who oppose anything that restricts in any way their actions. These agitators are most numerous, or most noisy, in those sections where Nature has been most generous in the matter of furnishing waterfowl. Here the opportunity to exploit the game in areas of concentration, and where by the lavish use of bait the natural opportunity to slaughter the birds has been increased many-fold, has so long been enjoyed by wealthy clubs that they have come to look on their selfish monopoly as a right that no one may question.

It was not unexpected, therefore, that opposition to the reduced season should develop. At first this took the form of efforts to have the seasons changed so that more ducks might be killed. Needless to say, politics was invoked in this effort. Among the states that were successful in having the season changed was Illinois. When the duck season opened Illinois shooters got their "share" and probably more, for Illinois is one of the states where man has greatly improved the natural opportunities to slaughter waterfowl.

Now that the season is over steps are being taken by the duck-killers to forestall any possible continued curtailment of their supposed rights. From certain clubs on the Illinois River, long notorious as a place where shameless methods of slaughtering ducks have been developed to a science, comes evidence of a well-studied attempt to discredit the Federal authorities and to build up sentiment against any further possible restrictions. An enlarged photograph showing two or three thousand ducks rising from the water has been circulated. The inference intended to be drawn from this is that there is still an abundance of ducks, and that the Federal authorities reduced the season in ignorance of the true situation. It is not stated that this picture was taken on Crane Lake, where thousands of bushels of corn and other bait are put out every year in order to attract the waterfowl to commercialized slaughter-pens of the most destructive type. The particular spot pictured is said to be called locally the "Million-dollar Hole," a term that probably connotes, in the minds of those who think that our ducks should go to those who have the dollars, a place where many ducks gather to fulfill their highest destiny.

This bit of shameless propaganda, circulated for the most selfish of purposes, and by a class of gunners who deserve no consideration in the minds of honest men, should defeat its own purpose, for it merely shows how ducks are lured to the slaughter by practices that must be speedily outlawed throughout the country if our resources in waterfowl are to be preserved in the future.

In certain places in Arkansas, by the lavish use of bait judiciously placed in surroundings that were naturally attractive to ducks, a system of commercialized slaughtering ponds was established that prospered for a season. But the brutality, both of the proprietors and of those whose lack of decency permitted them to patronize the place, brought the resort so much unfavorable publicity that the state by statute has forbidden all such methods of exploitation. Conditions on the Illinois River are scarcely less obnoxious to those who love our wild life, and wish to see it decently treated. From all appearances certain resorts on this river should be among the next examples of the Duck-hogs' Paradise to be outlawed.

Getting His Money's Worth

Many articles are written about the sportsman getting his money's worth, the inference usually being that he does not get it. So we are led to inquire what he considers his money should bring him in the way of game.

Figures compiled by the Federal government show that the average license paid by the sportsman is about one dollar and fifty cents a year. If one goes to market for meat, or, let us say, fowl, how much is he allowed to take away in exchange for his dollar and a half? Yet some of the states, in their zeal to show the sportsman how well he is treated, point out that in return for his license fee he gets game worth as much as three hundred dollars. Such treatment seems to merit no complaint from him. But, one may ask, how can the state afford to furnish that much game for a measly license fee? The answer is: It cannot, and it does not. The state merely allows the hunter to kill what he can out of a stock of game whose care the people have entrusted to the state authorities by passage of laws. When the native game, the property of all the people, is so depleted by the hunter that he cannot find enough to satisfy him, the state may purchase or raise some quail or pheasants, or rabbits, turn them loose, and call it game restoration. This hand-raised or hand-caught game may be considered to be the hunter's property, for he has paid for it. But before this property became existent, the hunter had destroyed most of the original stock, which belonged to all the people, so his title to his property may be somewhat clouded.

But besides the license fee, some of the hunters charge up as an investment their equipment, guns, ammunition, clothes, club fees, decoys, boats, bait, and sometimes transportation to and from their clubs, and expect a continual return on it. Well, this looks to us like their hard luck, for they have made an investment in something that does not belong to them. If we put money in seed to plant the craters of the moon, and then find that lack of oxygen impairs its value, neither the state nor the nation will guarantee any return. And we would not expect it. But the gunner, how he does fight to get his "share" of the game he has invested in so heavily—that is, to the extent of a dollar and a half a year—and then has shot from the face of the earth.

Bears Again Raid

Bears are the chief comic-cut-ups of the National Parks. Most of the wit and humor radiated from these preserves figure them as principal actors, and their antics delight multitudes. Usually, however, there is a "fall guy," to adopt the language of the vaudeville, who has to bear (no pun intended) the brunt of their jokes, and in a recent episode which took place in Mt. Rainier National Park, that individual was Assistant Superintendent Carlson. He was awakened one night by goings-on downstairs, and carefully crept to the pantry ready for every emergency. But alas, the emergency had passed—for beside the refrigerator and its wide-swung door and in the midst of the contents thereof lay a bruin, fast asleep in that slumber that follows upon a full stomach. He had evidently walked in, turned the knob of the icebox, and waded through the delicacies, then went off to dreamland in his tracks. Mr. Carlson still fails to see that the escapade had a great deal of humor in it.

Wildings at Home

The interest which has developed recently in wild flower gardens has inspired Frank Pellett to write a valuable and informative book on wild flower cultivation. Its title is *Flowers of the Wild, Their Culture and Requirements*. Profusely illustrated with excellent pictures, it reveals the possibilities of developing attractive floral displays by the sole use of woodland natives, and passes on the information on care and treatment so necessary in dealing with these shy plants. The volume is published by A. T. De LaMare Co. at $2.00.

New Balboa Museum

Taking advantage of the present low building costs and with a view of helping the unemployment situation in San Diego, the directors of the Natural History Museum at Balboa Park are attempting to construct this year not only the first rectangular unit of the new museum but also one of the wings, and have issued the call for $25,000 to complete this work. The collections of the San Diego Society of Natural History are now in temporary buildings which are fast disintegrating, and in constant danger of destruction by fire, and it is hoped to remove them to fireproof structures before disaster overtakes them. Miss Ellen B. Scripps has already given $125,000 for the new buildings, and an additional $25,000 will enable the present plans to be carried out.

Controlling Insects

A book that every gardener will find as necessary as his hoe or his overalls is *Insects and Their Control,* by Andrew Wilson. Its title neither adds nor subtracts from the subject matter, which is as complete as science can make it relative to both the kinds of insects which attack plants and the types of attack which will stop them before they do damage. It is replete with pictures of the principal enemies of the gardener and the effects of his work. Its price is $2.50 postpaid from Springfield, New Jersey.

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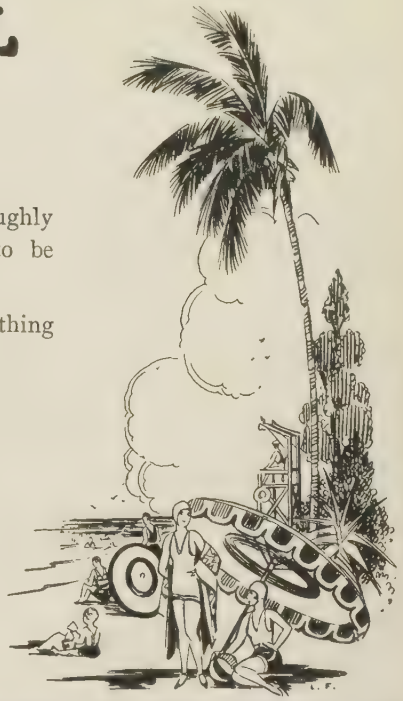

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Total expense for a month's cruise $750 per guest

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Seattle Yacht Club, Seattle, Washington

References: The editors of Nature Magazine. Names of many others who have made these "Westward" trips will be sent on request.

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YOU too will appreciate the better comfort and protection of your famous Woods Arctic Down Sleeping Robe, official equipment on the Akron and the Los Angeles. Snug and safe from bad weather, in any camp or cabin, boat, cottage or sleeping porch.

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THE HOME THAT WON A PRIZE

For her work in beautifying these premises, Mrs. Charles A. Emery, the owner, was given first place in the national Yard and Garden Contest

Californian Wins Contest

Mrs. Charles A. Emery of Pomona, California, captured the first prize in Class I of the national 1931 Yard and Garden Contest, defeating seven hundred competitors. The event was conducted by the Yard and Garden Contest Association and was open to those home-owners who had won a first prize in their own community yard and garden contest.

Mrs. Emery was selected as the winner after the judges had examined more than a thousand garden views sent in from all parts of the country. As it was impossible to visit the homes of all the contestants, the judging was based on photographs.

The competition has proved that American families are moving out-of-doors during the summer, George M. Sheets, director of the Association, believes.

"Development of a new and absorbing interest in that portion of God's footstool which lies just outside their door is a significant trend in American psychology," he said.

"The new conception of a garden is a secluded, restful nook just outside the door, made beautiful with graceful shrubs, bright-faced flowers, green grass and branching trees, and furnished for comfortable living with garden chairs, benches and hammocks for the grown-ups, swings and modern playground apparatus for the kiddies, and tea or bridge tables to facilitate the entertainment of the family's social friends.

"Throughout the country the planting and beautification of home grounds flourished despite the business depression. People may have had more time for gardening than in preceding years. Certainly they had more inclination."

Save the Pedestrian

A move to bring back the healthful exercise of walking by providing walkways along the marge of highways has been inaugurated by the American Society of Municipal Engineers. This body has prepared a model law which provides that the State Highway Commission shall construct and maintain sidewalks along and adjacent to at least one side of all State highways. To date West Virginia and Massachusetts are the only states permitting state expenditures for walkways. The effort the Society is making will have the support of all Nature lovers.

Smoky Project Nears Goal

With the acquisition by the Federal Government of nearly 150,000 acres to supplement the 160,000 acres previously deeded over for national park purposes in the Great Smokies, the Department of the Interior announces that more than two-thirds of the acreage necessary for the creation of the Great Smoky Mountains National Park is already under the aegis of the Park Service.

Butterflies on Wing

While the winter storms rage amid the peaks of the Siskiyou Mountains, Oregonians are wondering what has become of the millions of butterflies which were seen last summer flying wild over the mountain range at an altitude of more than a mile above the sea. These brown-winged creatures, specimens of *Vanessa californica,* were observed by a party of hikers last July and were headed south. They rushed over the knolls, among the rocks and across the clear spaces in untold numbers, and required two hours to pass a given point. The lookout man on Dutchman's Peak told Henry Isely, who reported the migration to us, that they had been passing his station in steady flight during all of the four previous days. Similar bands were reported as hovering near the ten-thousand-foot level of the Three Sisters Mountains, about one hundred and sixty miles north of Dutchman's Peak. Where these migrants were going and whether they arrived successfully at their destination are facts still unknown.

A Friendly Bird

When Oscar H. Bauer of Hartford, Wisconsin, was fishing last summer in Post Lake in northern Wisconsin, he had an experience thousands of Nature lovers in all parts of the country would wish to have. Just at dusk, shortly after the fish had made up their minds that they had bitten enough for one day, a flock of cedar waxwings, in hot pursuit of an evening meal of gnats, came by. Mr. Bauer was as quiet as a statue. Suddenly he felt a light tap on his hat, then a slight push and the flutter of wings. A small bird brushed him and alighted on the tip of his pole. In a few moments it left, and he was about to reel in and go back to camp when another one of the birds fluttered down. It came to rest on his pole within six inches of his hand. Quite calmly it poised there, surveying the world; then the little feathered hunter dashed after its prey, leaving the fisherman certain that no thrill of landing a "big one" could equal the thrill of its visit.

Guide to Blue Ridge

The indefatigable Potomac Appalachian Trail Club has just issued a handy little guidebook to paths in the Blue Ridge Mountains. It covers in detail 506 miles of Appalachian Trail and 65 miles of side trails in Virginia and adjacent states, and is replete with maps to help the weary traveler find his way. Additional to its trail information, it contains chapters on the geology, the wild flowers and the forest trees of the region and a most valuable section on the treatment of emergencies and snake bites. Bound in blue buckram with a snap flap to protect the leaves and with a pocket in the back for additional maps and data, it is a handy addition to the hiker's equipment. It is priced at $2.50 by the Club.

Prize Winners Announced

Miss Edith Mirick of Washington, D. C., has been selected the winner of the 1931 Alberta Clark Walker Memorial Nature Poem Contest for her poem, "Walk at Sunrise." The second choice was "Rest Me with Nature," by Mrs. J. C. King of Pine Bluff, Arkansas, and third place was taken by "Blue Heron," a poem submitted by Miss Frances Hathaway of Aberdeen, Washington. The Nature Poem Contest is conducted by the Chattanooga Writers' Club and prizes are distributed from a fund created by Robert Sparks Walker in memory of his wife. The judge this year was Dr. Wightman F. Melton, the editor of *Versecraft.*

"Bull" Adopts Bear

New Orleans society is all agog over Pansy, the bear pet of Joe Leiter, famous "bull" of the Chicago wheat market. Pansy goes to the débutante parties, but prefers concerts, being musically inclined. So far, she has not tried operas, but the opinion in the exclusive circles is that she would take to them as her wild relatives would take to a honey bees' hive. Mr. Leiter bought her from a hand-organ maestro in Chicago, and made her a family pet. She follows members of the household like an affectionate dog and is especially fond of Tommy Leiter, the nineteen-year-old son. While the Leiters were in Chicago, at their summer home, it was the custom for all invitations to contain a notation at the bottom, "and please bring Pansy."

Helps and Hints

FOR HOME AND GARDEN

ANTING THE GARDEN, MONTH BY MONTH

By Romaine B. Ware

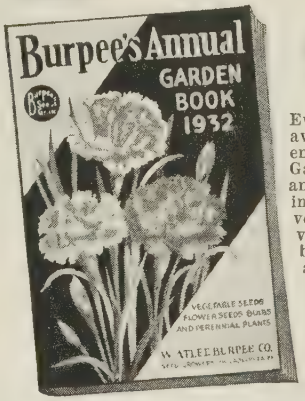
ust what kind of a garden do you want year? Are you going to be satisfied h the same beds and borders you had season? Maybe they were good borders, you should be able to do better after year's experience. Each year your gar- should show some improvement; each r new varieties should be added to pep p, to create new interest. The growers, nt hybridizers and plant hunters are tinuously offering new varieties in vers, shrubs and trees, and while not rything offered is worthy of a place in gardens, we should not neglect to check on the new offerings.

can hear some of you asking, "Where ne to learn of these new introductions?" dy the catalogs, not just one but a dozen ferent ones. Catalogs are prepared for r information, frequently at tremendous ense. They may be had for the asking, just getting some catalogs will not im- ve your garden. You must go through m and familiarize yourself with the of- ngs of the different dealers. No matter at type of garden your fancy dictates, re are dealers who specialize in them. ny flower specialties such as dahlias, ds, iris and others are featured by hun- ds of growers. Rock plants, ferns and ive plants, lilies and all kinds of bulbs l be found in various catalogs.

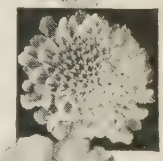
Some of you will say your gardens are full now you cannot find space for any- ng new. In this event they doubtless tain many things unworthy of them. ese should gradually be removed and re- ced by new varieties. You may get some ngs that will not prove satisfactory, but se again may be replaced, and at least r garden will be changing and develop- . Among almost all varieties of peren- ls, improved kinds have become avail- e in the last few years. One would no ger think of keeping the old brick-red ental in the garden with all the fine new ned varieties in choice colors available. ewise old varieties of hardy phlox, most them extremely susceptible to rust and ght, should be replaced by some of the ver originations, carefully bred to resist se pests.

As one looks over the lists in modern alogs, many new things are found. A rious double white delphinium has re- tly become available, and while the blue ms are absolutely indispensable in the den, the white will prove a welcome lition. A new heuchera from France is ving a vast improvement over the older ts, being much more brilliantly colored. e demand for dwarf iris for rock garden- has become nation wide. Many new ieties are available among which are two rblooming sorts, Jean Siret and Souv.

Burpee's Garden Book FREE



Every year this great Garden Guide is awaited with special interest by experienced gardeners, for Burpee's Annual Garden Book is always a source of new and interesting information. Burpee has introduced in America more distinct new varieties of vegetables and flowers that are now in general cultivation than have any three other seed houses combined. This year Burpee's Garden Book is bigger and better than ever. It describes all the best vegetables and flowers including 117 **new** varieties. Hundreds of illustrations, many in natural colors. **Luther Burbank** said: "Your catalog is a gem. I always refer anyone asking for seeds to your firm as I consider your house the most reliable retail house in the world." Write today for your free Book.



Burpee's Finest 1932 Novelties

To add **new** beauty, **new** colors, **new** variety to your 1932 garden, we offer a remarkable list of delightful giant novelties. With them you can make your garden the envy of all who see it. Order promptly to be sure of getting these **lovely new flowers.**

Snapdragon Floradale Salmon Rose (Antirrhinum Maximum). This beautiful shade adds a new and much sought after color to the Maximum group and gives us the most gorgeous Snapdragon of all. It is a lovely salmon combined with begonia-rose. **Per packet 35c**

Nasturtium Golden Gleam. A new double sweet-scented Nasturtium. Large, golden-yellow flowers are borne in the greatest profusion on erect 6-inch stems well above the foliage. **Per packet 35c**

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Aster Improved Giant California Sunshine. A new race of Asters in startlingly beautiful colors and of enormous size. Finest mixed. **Per packet 35c**

Larkspur Giant Imperial Miss California. More distinctly of the upright or Delphinium type than any yet introduced. Double flowers, deep pink on salmon ground. **Per packet 35c**

Any 4 for only $1.00 The regular price of the lovely new flowers described above is 35c a packet. Act promptly and you may have your own selection of any four for only $1.00 (regular price $1.40) or any assortment of ten packets for $2.00 (regular price $3.50). Don't risk disappointment. Write today.

Send at once for your free copy of Burpee's Annual Garden Book for 1932.

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Hardy Plant ROOTS Make Your Success *Certain*

THESE Wayside two-year-old, out-door grown plants, with their sturdy, bushy roots, cost you no more than the usual spindly yearlings.

Ones that have been coddled are apt to be soft. Wayside's have bucked up against at least two winters right out in our fields, and come through smiling.

Furthermore, if after having had reasonable planting care any plants you buy of us, fail to live up to our promises, then let us know, and we will *promptly* and cheerfully make good. Note that word cheerfully.

Reg.U.S.Pat.Off.

And now another thing. We have a new catalog. Not just a reprint of last year's. But one bettered in any number of ways. You will find it easy to order from, and a most helpful growing guide. None of these old-time "general directions". Every plant has directions *all by itself*. Send for the Catalog. Order early to get early results.

Wayside Gardens

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Scott's Creeping Bent for Perfect Lawns!

Sod in six weeks. A rich, velvety stretch of lawn that chokes out weeds before they can grow! A deep, thick, uniform turf that's everlasting and that makes your home a beauty spot.

The New Super-Lawn

Instead of sowing seed, you plant stolons or the chopped grass—and in a few weeks you have a luxuriant lawn like the deep green pile of a Turkish carpet. Read all about this unusual grass in our illustrated booklet "Bent Lawns." Mailed on request.

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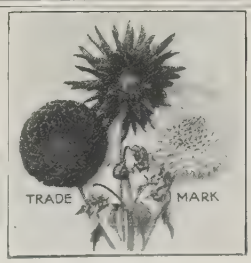
135 Main Street, Marysville, Ohio



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For $1.00 we will send you, postage prepaid,

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4. Star Guide to Good Roses for 1932 Describes and pictures nearly 200 of the most dependable roses, 62 illustrated in natural colors.

"Star Guide" and "Rose News" sent promptly—roses at planting time. Send $1.00 at once, while this offer lasts.

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Shumway's
Good Seeds
Sure Producers of Quality Vegetables and Flowers

Tested, new crop seeds, grown from finest selected stocks—sure, vigorous producers. For 62 years Shumway's Seeds have sold at very reasonable prices and have always given the desired results. *Extra packages sent free for trial with each seed order.*

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Send for my new 36-page Gladiolus Book, describing 183 exquisite varieties, many new. Tells how to grow them. 45 illustrations. It's free!

My famous beautiful RAINBOW COLLECTION will delight you. 1 bulb each of 30 varieties (not labeled) all colors, blooming size, planting hints included, satisfaction guaranteed, $1.00 postpaid. Order today.

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Musical Comedies, Operettas, Vaudeville Acts, Minstrels, Comedy Songs, Make-up Goods.
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T. S. Denison & Co. 623 S. Wabash, Dept. 37, Chicago

de Lieut. Chavagnac. These bloom for several months and are doubtless the forerunners of a new race of iris with everblooming habits. Among fall asters, chrysanthemums, dianthus, pentstemons, veronicas and many other varieties of perennials and bulbs, new kinds have become available.

With peonies, one of our most important perennials, many wonderful new ones have been developed and introduced, especially in the past twenty-five years. Some of the later varieties are very scarce and naturally high in price. But there are a score or more excellent kinds which may be purchased quite reasonably. Of course, one does not plant peonies in the spring; September is the month for this, but during the blooming season is the time to select varieties. Choosing from catalog description is seldom satisfactory.

During the next three months we will witness the grand parade of spring bulbs. Snowdrops, scillas, crocuses, narcissuses, tulips and hyacinths make never-to-be-forgotten pictures in our gardens. All of these things demand fall planting, but, as with peonies, you should choose your varieties during blooming season. Countless thousands of gardeners vow they will plant bulbs next fall, but by the arrival of planting time, something else has taken their attention and possibly their funds also, so another year slips away and another spring season finds their garden shy of bulbs. Why not select during the blooming season and make definite plans for planting? Go through your garden and choose spots where colonies of bulbs will fit in and mark them carefully with stakes projecting a few inches from the ground. Then make up a list of bulbs according to space available and your taste as to varieties.

Bulb prices and varieties vary somewhat from year to year, but unless you go in for the new novelties you can plan your bulb order quite definitely. In spite of extensive advertising, many gardeners neglect to order their bulbs until just about planting time. With some varieties, especially tulips, this is rather late. The bulbs of most tulips are imported and these orders must be in by midsummer. Many of the better dealers issue their catalogs during the early summer and by making your selection during blooming time and getting your orders in early you will secure what you want and assure yourself of an adequate bulb display in 1933.

A wide variety of flowers, shrubs and trees may be planted and transplanted in the early spring. The sooner this work is done after frost leaves the ground the better your garden will be. Most plants start growth quite early and may be more easily and safely moved before they are too far advanced. Plan now what you will plant, visit your nurseryman or choose from the catalogs and be ready when planting time arrives.

Many amateurs become ambitious with the pruning shears along about this time and unless they know what needs attention, numerous mistakes are possible. Spring blooming shrubs such as lilac, spiraea, mock orange and a score of others should not be pruned till just after they flower. Trimming at this season removes blooming wood and unnecessarily sacrifices bloom. Varieties, however, which bloom on new wood and those producing foliage effects only may be pruned at most any time.

FREE Fertilizer with a Beautiful Garden of ROSES

WILSON'S SEAL KRAFT TRADE MARK MANCHESTER, CONN.

Every one a genuine "Seal Kraft" trade-marked plant—large, 2-year-old, field-grown—**GUARANTEED** to live and bloom true to name the very first season.

Our secret sealing process preserves full life and vigor from Nursery to Garden, insuring safe planting—quicker growth—better bloom—no disappointments.

A Fine Garden of Roses $5.88 postpaid.

All Everblooming. Every color and shade including the latest.

Talisman	Souv. De Geo. Pernet
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Red Radiance	Duchess of Wellington
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Less than 12 Roses, 49 cts. each, plus 5 cts. additional per plant for packing and postage, except Talisman which is 75 cts. plus 5 cts.

FREE Ample fertilizer sent with each full dozen if ordered immediately. Also FREE our valuable "Seal Kraft" Rose booklet.

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Water Lilies
Now the Center of the Outdoor Living Room

A tub or pool of Waterlilies will be the center of interest in your garden. No flowers exceed them in beauty or fragrance; so easily grown that you may have them on porch or roof-garden. With a few Goldfish slipping in and out among the flowers and foliage you have a summer-long source of delight.

Beautiful Illustrated Catalog of Waterlilies and Goldfish

Shows many lilies and fish in color; tells the best lilies and how to grow them in tubs or pool. **Catalog free east of Rocky Mountains** (west of Rockies send 15 cts., Canada 20 cts. for catalog).

THREE SPRINGS FISHERIES
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ROSES

Four New Favorites!

Dame Edith Helen, soft rose pink. **Margaret McGredy,** brilliant oriental red. **Rev. F. Page-Roberts,** rich golden yellow. **President Hoover,** pink, scarlet and yellow—usually selling for over $1.00 each. **ISBELL PEERLESS COLLECTION.** Four strong 2-year-old plants (1 of each) only $2.50 Order NOW—will be mailed postpaid at proper planting time. Isbell's New Seed Annual of helpful information FREE. Post card will bring it. Write today. **ISBELL SEED COMPANY**
240 **Mechanic St.** (26A) **Jackson, Mich.**

Most evergreens which require pruning may be attended to just as new growth starts. Pruning too early is harmful.

The pruning of roses may be done as soon as the buds begin to swell. With both hybrid teas and hybrid perpetuals, the more severely you prune, the better quality of bloom you can anticipate. Climbers must only be pruned after blooming. Don't be afraid to cut your roses back severely, as you are doing them the greatest benefit. With hybrid teas, four to six inches from the ground is not too severe, while the stronger growing hybrid perpetuals may be cut back to eight or ten inches. Leaving old wood two and three feet long results in the production of numerous weak stems and blooms of poor quality. Don't fail to feed your roses generously, as they demand a large supply of nourishment. Vigorous growth is not possible without adequate feeding.

Doubtless many of you are planning to add a rock garden to your layout. They are among the most interesting features of our gardens, but to make a rock garden that is truly artistic demands a lot of study. Just piling a lot of rocks on a mound of soil and planting among them does not constitute a rock garden. A rock garden should begin with an understanding of placing rocks. They must be placed in a natural manner, not with the idea of displaying the rock but primarily to make a home for plants. Study everything you can upon the subject of rock gardens; learn all you can about rock plants and their requirements. Try to make your rock garden as natural as possible and plant it with plants particularly chosen for the purpose. Don't let your rock garden be a collection of leftovers. It can become the gem of the garden or merely a collection of odds and ends, all depending upon how much care and thought you give to its planning and planting.

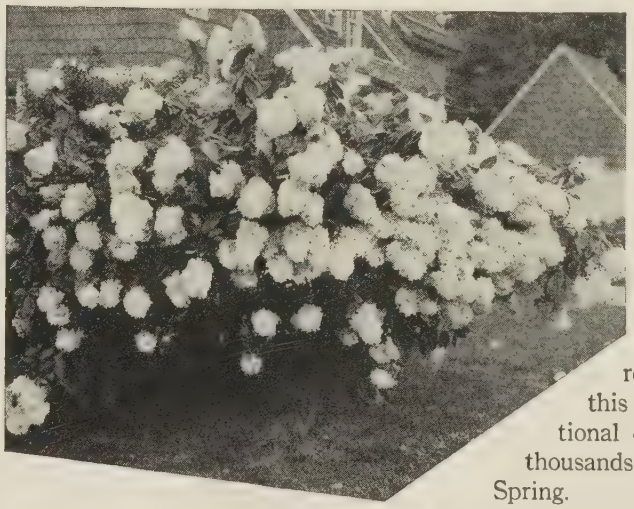
Different types of rocks demand different arrangement. Stratified rock should be placed as nearly natural as possible with the layers or strata in parallel formation. Don't stand a lot of slab rocks on edge like misplaced tombstones. They do not appear natural that way and in rock gardening even more than most other types of gardening we should endeavor to secure natural effects. Rocks of all kinds should be well embedded in the soil, never merely laid on the surface. Where possible they should appear as an exposed ledge and give the impression that below the surface there are many more rocks. Such effects are not difficult, but they require thought and study, thus making rock gardening one of the most delightful of garden hobbies.

Whither Goest?

The fascinating and essentially romantic problem of migration is regarded from the viewpoint of the biologist and the laboratory expert in *The Riddle of Migration,* the work of William Rowan, of the Department of Zoology at the University of Alberta. His book is more than an account of laboratory experiments, however; it is written by one with a keen imagination and a deep understanding of the relation of the problem to the mysteries of life itself, and it is as worth while to the intelligent layman as to the ornithologist. He concludes that the migratory urge which takes many species of birds from one end of the earth to the

5 Hardy Hydrangea FOR $1

add 15c for postage



The biggest bundle of shrubs for $1.00 you ever saw

Money back if not satisfied

Plants, fully 2 years old, 18-24 inches, well branched and rooted. Should bloom this Summer. This exceptional offer is made to gain thousands of new customers this Spring.

Our 48-page Catalogue is Free. Send for it today

Describes and illustrates our complete assortment of plants, shrubs, evergreens, fruit and shade trees, and perennials grown at Glenwood Nursery including choice varieties of Roses, the new Chinese Elm, Blueberries, Azaleas, Rhododendrons, lovely French Pussywillows, Rock Garden Plants and Hardy English Walnut Trees. 53 subjects in color, 5 pages explaining our complete landscape service.

We sell direct from nursery to you the finest stock grown, packed to reach you in perfect condition.

Glen Brothers, Inc.
1764 Main Street, Rochester, N. Y.

GLENWOOD NURSERY—Established 1860
"We furnish the home—outdoors"

Ragged Robin or Bachelor's Button?

Neither name is correct, as you can see by referring to Page 77 of Dreer's Garden Book. Don't envy your friends who can speak with authority on any subject pertaining to flowers. Be like them. Get the new, revised 1932 edition of this one completely authoritative work of its kind.

Sent free on request to those interested in vegetable and flower seeds, roses, perennial plants, etc.

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Pres. Washington Rose FREE

To commemorate the 200th Anniversary of the "Father of our country", we offer the President Washington, value, $1.50, a grand old-fashioned deep carmine Rose FREE with

"Presidential Rose Group"

Pres. Hoover, medium orange, shaded to gold. **Pres. Coolidge,** glowing crimson; **Pres. Wilson,** unusual pink; **Pres. Taft,** salmon-pink. All four Roses with the Pres. Washington FREE, postpaid $1.95. All 2-yr. field-grown plants. "Rose Lovers' Guide" FREE with every collection. Order today.

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other twice every year has been built up by a process of natural selection promoted by environmental conditions, and is evoked at the proper time each season by internal and external stimuli. The chief external stimulus, he believes, is the duration and day-length, which acts on the internal stimulus, a hormone produced by the interstitial tissue of the reproductive glands, to send the birds on their way. Professor Rowan writes with all the simplicity and clarity of style of the late E. E. Slosson, and builds up his theories so logically that few will have difficulty to follow him. The book is printed by the Waverly Press, Inc. of Baltimore, and is priced at $2.

Attuned to Nature

When one peruses the collection of Tom Sweeney's essays and poems which are published under the title of *Horizon Frames*, one gets the impression of an author attuned to the out-of-doors and deeply concerned with its mysteries. Each carefully constructed line of the prose passages that alternate with the rhythmic bits of verse reveals the man who finds "tongues in trees, books in running brooks," but who is not so certain that there is "good in everything." Particularly fine are his poems of the sea, which carry the idea of the power and peace of the oceans, both in their phrasing and their rhythm. The main criticism of the book lies in the fact that frequently the prose bits tend to explain too well the idea of the poems that appear on the pages opposite them, thus vitiating much of their strength. We would triple-star "Solitary Woodpaths," "Young Wife," "To Live as Children" and "Strikes." The book is published by Poetry Publishers of Philadelphia at $2 for the regular edition and $3 for a de luxe printing. The illustrations are by Bjorn Egeli.

Turtle vs. Turtle

It was a battle royal. The two turtles, their heads as large as a man's doubled fist, their legs as thick as a human hand, circled around each other, uttering throaty noises. Suddenly, with a swiftness that belied the Aesop fable, one charged the other, and equally quick, the attacked turned on his side, taking the force of the plunge on his shell. The impact sounded like a pistol shot. Then the defender turned attacker, and flung himself at his enemy, who likewise countered the blow. Minute after minute passed, and the struggle, resembling that of two war-time tanks, went on. Neither noticed the man wading out into their swamp, armed with a revolver. He got within six feet of them; he fired once, twice, six times; yet they did not hear or feel afraid, so intent were they on destroying each other. Finally, in disgust at his aim, the human went back to shore, while the battle raged.

This fierce struggle of two turtles, which is one of the few ever recorded, was witnessed by Mrs. Francena L. Sherburne of Tyngsboro, Massachusetts, in 1885. It was her husband who tried to capture the warriors for the pot, but was prevented by their quick movements. How frequent are such intense conflicts between snapping turtles cannot be estimated, but there are few records of such occurrences.

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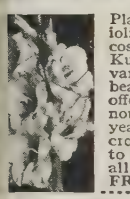

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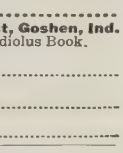

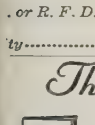

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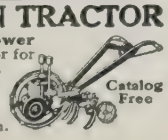

Catalog Free

Exhibit of Early Man

Visitors to Grand Canyon next year will have a new sight to demand a share of their interest and time. It will be the "Wayside Museum of Archaeology," which has been constructed close to the Tusavan Ruin on the South Rim, and which by graph and exhibit will tell in easily understood form the story of early man in the Grand Canyon region. Among other features will be a chart showing man's place in the history of the world, a graph of his family tree, exhibitions revealing skull development and progress in pottery work and models of the ruins. This museum is so located that the visitor will have first seen the geological exhibits at Yavapai Station, and will be ready to carry to the modern age the fascinating tale of man's progress.

Any Spare Skulls?

One of our members, Dr. A. J. Padberg of 3900-A Easton Avenue, St. Louis, Missouri, has for some years been collecting both human and animal skulls to use in an intensive study of comparative dental anatomy. He would like to get in touch with other members who might have animal skulls, particularly those of marsupials, rodents, quadrumana, felidae and canidae.

Poems of Trees

A book of poems devoted exclusively to trees has been issued under the imprint of Ralph Fletcher Seymour of Chicago. It is *Trees and Their Legends,* (a slightly misleading title), and is to be noted as much for its charming woodcuts, the work of Mr. Seymour, as for the poems by Mildred R. Beatty. The poetess has striven to depict in a few lines of verse the chief characteristics of each of the principal forest dwellers in America. The following poem will indicate the treatment:

In Fredericksburg on Farquire's land
An old historic chestnut stands
The last of thirteen planted there
By Washington—our country's père.
So much he loved all forest trees
Their stately stems, their whispering leaves,
And held, that they were gifts from God
Most nobly sprung from earthbound clod.

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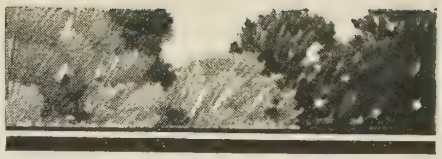
A process which will enable department stores to sell over the counter superior qualities of rose bushes and other ornamental plants has been established by the C. E. Wilson Company of Manchester, Connecticut. This company supplies for the retail trade high-grade stock wrapped and sealed in such a way that it will stand three weeks or more of hot, dry atmospheric conditions without losing the moisture so essential to its health. Plants packed by them are said to develop new shoots and foliage within their wrappers, and even put forth buds. If planted shortly after being removed from the package, these bushes will thrive as well as those transplanted immediately from beds, despite the fact that they may have sojourned for several weeks on store shelves. Roses now join cigarettes, handkerchiefs, shirts, chewing gum, and other nationally advertised products in being wrapped in air-proof packages.



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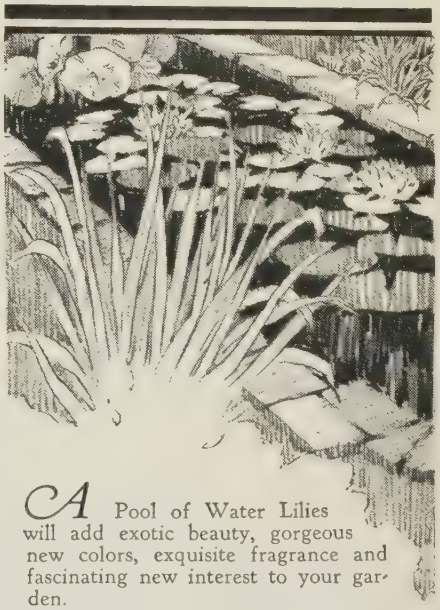

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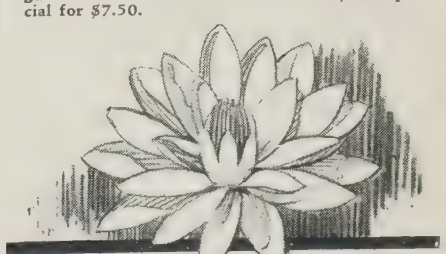

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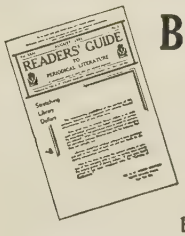

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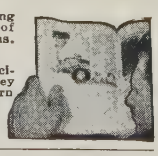

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BEARS OF ADMIRALTY

(Continued from page 86)

fish, you ought to see four or five bears together." He had hardly finished speaking when two brownies—probably three-year-olds—appeared at the head of the riffle. In a moment they came galloping down towards the blind, side by side, a perfect picture of two woolly teddy bears at play. Neither of them connected with a fish, but on they came, closer and closer, heading for the lower riffle. At about forty feet they saw the hunters and stood up together.

"Pooh!" grunted one. "Booh!" growled the other. Booh walked three steps closer on his hind legs. He was only twenty feet away from us, and it was easy to see that he stood much taller than a tall man. Pooh hung back. "Booh! Pooh!" they growled together. I could hardly hold my camera, I was shaking so with suppressed laughter. Even Hasselborg forgot himself, and remembered to point the still camera only after Pooh and Booh, thunderstruck by our laughter, had retired to the bushes to think things over.

Just after they disappeared, Finley ran out of film. As his tripod was in the best place in the blind, I hastily called to him to exchange cameras. "I'll load yours while you stand ready for whatever comes," I whispered. It required only a moment to carry out this operation, screwing the loaded camera on the tripod. I had opened the empty camera and was just starting to thread up a new film when things began to happen. This time the bear was an old she-grizzly, very dark brown in color. Hasselborg now gripped his gun as if he meant business. The film-loading job had to be finished; it could not be set aside without a risk of spoiling the film already exposed, so I persisted, but out of the tail of one eye I could see the bear. She stood on her hind legs in the water, only ten yards away, growling and weaving from side to side. Hers was no comical face. Her long grizzly nose wrinkled up in a snarl. Her eyes were hard and full of hatred. She watched the man with the gun, who stared back at her steadily and intently.

Suddenly, for the third time on our trip, the courage and confidence of our experienced guide won out. The grizzly dropped to all fours, but her head was not down for a charge. She edged slowly out of the water at the opposite bank, growling and pausing from time to time, as if about to turn and attack. Then, rumbling, she stalked off into the bushes.

A few moments later the sun disappeared behind the mountains in the northwest. "The tide is running out," called Hasselborg. "If we don't want to have to carry that canoe for half a mile or so, we'll have to hurry." He seized one of the paddles which he had brought with him to the blind and with it splashed over every inch of the gravel bar where the blind was, to wash off the man-scent as well as possible. We three now splashed down the riffle and threw our packs into the canoe. The guide jumped in and began to pole furiously for deep water, while we waded alongside.

As we passed out of the creek into the bay, I looked back. There, in the riffle, standing side by side on their hind legs,

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were Booh and Pooh. It was as if they had come back as a committee of farewell to see us embark. Indeed, I imagined that I could see their front paws waving in salute as we took up our paddles. But I doubt if the thought in their minds was "Do come again."

Living Outdoors

Naturally enough, the more Americans are restricted to the city, the more they turn to the out-of-doors, finding in many cases an outlet in their own home surroundings. This is the age of the discovery of the backyard. Summer months mean that families add another room to their houses—an outdoor living room which can have all the charm and beauty of any room inside. L. W. Ramsey and C. H. Lawrence, landscape architects both, have now given an impetus to the movement by publishing an excellent volume on the creation of this summer room, suggesting plans, decorations, and furnishings. Whether the plot consists of but a small stretch of lawn, or whether it covers half an acre, this volume will be of assistance in making the best use of it. The authors always keep in mind that the two essentials of an outdoor room are privacy and livability, and make their suggestions relative to hedges, shrubs, trees, pools and arbors with this aim in view. The volume is as practical as a timetable—and as timely, while being much easier to read. It is published by Macmillan for $2.50.

Winging Feathers

There are three principal types of bird students—those that observe them from the purely scientific angle, keen on analysis and the discovery of new species; those that are primarily interested in their economic side, and the smaller number whose sole interest is to derive enjoyment and satisfaction from listening to the songs, watching the flashes of color and thrilling to the scene of parents training their young. To the last-named class belongs Frances Staver Twining, whose book, *Bird-Watching in the West,* relates, in a gentle, pleasant style some of the experiences this Cooper Ornithological club member has had with the birds. It is a book bird-lovers will wish to pore over, a book which will evoke memories of one's own pleasant days afield. Ably illustrated by Florenz Clark and excellently printed by the Metropolitan Press of Portland, Oregon, the volume guarantees hours of enjoyable reading. It is priced at $2.00.

Palisades Fishing Survey

In an endeavor to improve fishing in the eighteen lakes and ten streams in the Harriman and Bear Mountain sections of the Palisades Interstate Park, the New York State Conservation Department and the Interstate Park Commission is stocking with larger numbers of young fish from the hatcheries. The fishing grounds in this park form practically the only outlet to followers of Walton within reasonable distance of the metropolitan area of New York.

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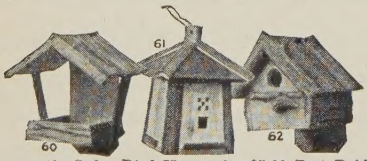

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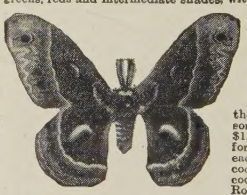

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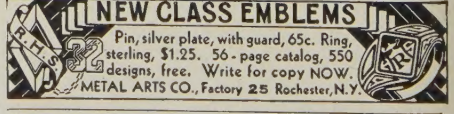
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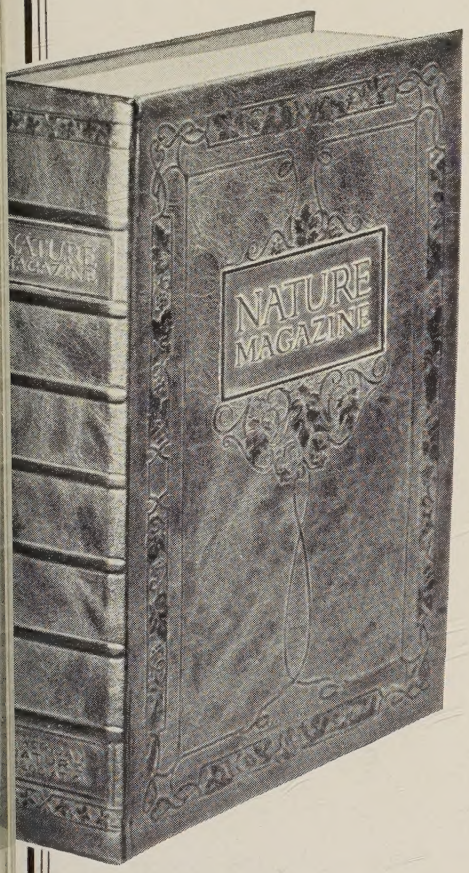

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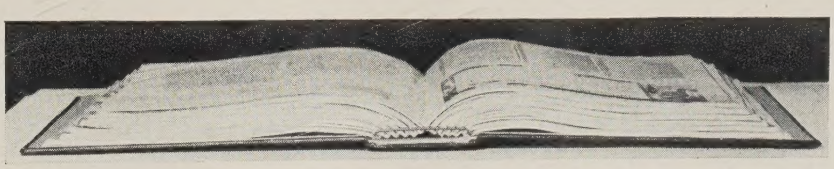

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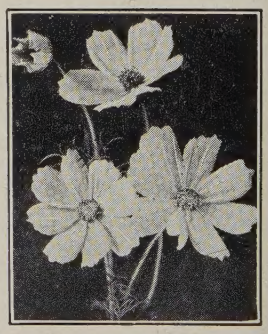

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